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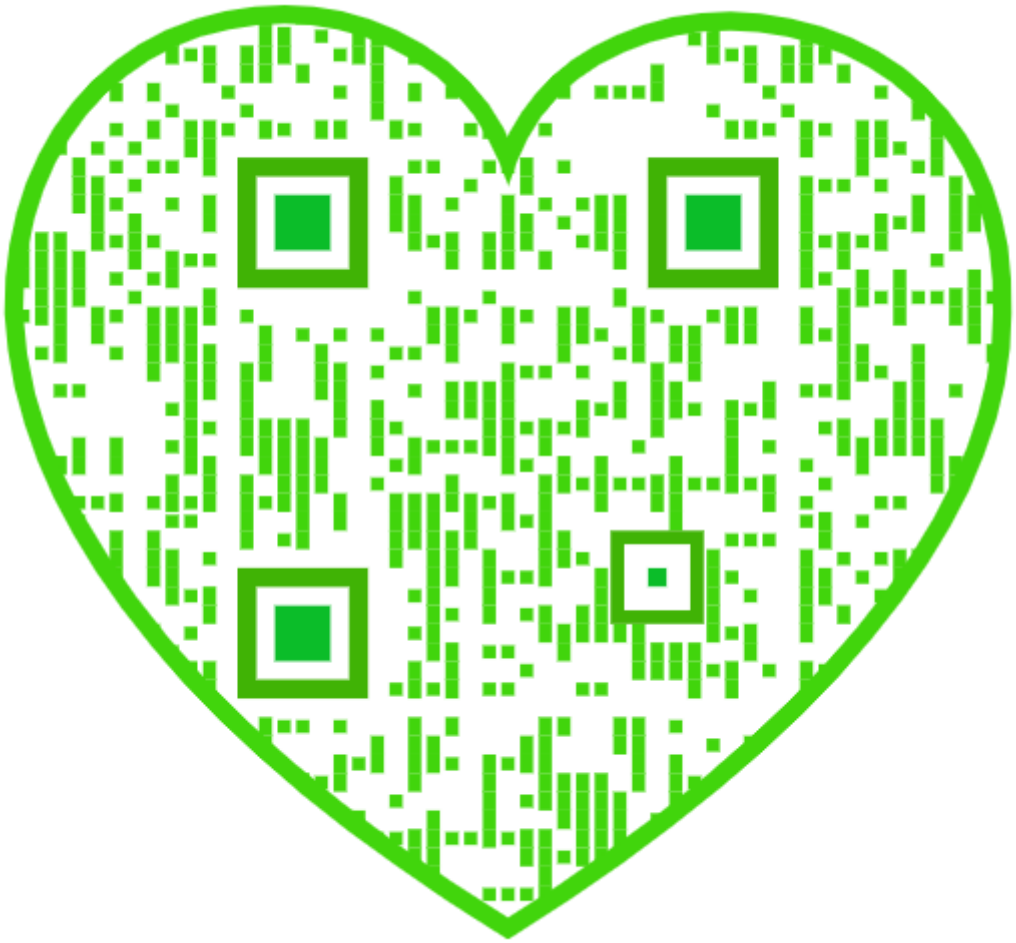
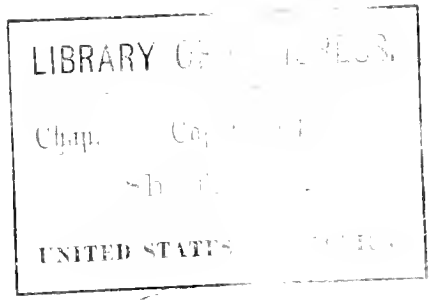
Garment Cutting
in
The Twentieth Century

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G. F. Hertzer

To Mother.

Twenty years—the best of thine;
Twenty years—a quite long time;
Twenty years of thy devotion,
Twenty years of my queer notion.
Twenty years of expectation,
Twenty years of tribulation;
Twenty years of hope and fear,
Twenty years of wear and tear.
Twenty years of great vexations,
Twenty years of few vacations;
Twenty years of silent praying,
Twenty years of hopes delaying.

Twenty years? near twice that time
To train eight children—a work sublime.
The first—six years old—she has gone;
Emma found a heavenly home.
All the others, I must show,
Put grammar in this book. You know
Upon the slightest call from me,
They spelled or wrote as it should be.
Quite trusty places they now hold,
And all are worth their weight in gold.
Twenty years thus we did spend,
Until this book has come to end.

GARMENT CUTTING

. . IN THE . .

TWENTIETH CENTURY.

CONSISTING OF A SERIES OF ARTICLES ON

GARMENT CUTTING AND MAKING

WITH

ILLUSTRATIONS BY DIAGRAMS,

SHOWING THE COMMENCING POINT

AT THE CENTER OF A CIRCLE IN GENERAL,

AND RADIATING ON ESPECIAL ANGLES OF

135, 120, 90, 60, 45, 30. 22 1-2, 20, 15, 10, 7 1-2, 5, 2 1-2, Etc.,

BUT MORE ESPECIALLY TWO ANGLES OF FIFTEEN DEGREES EACH,

JOINED AT THEIR WIDEST END.

ALL RIGHTS RESERVED BY

GÜNTHER F. HERTZER,

AUTHOR,

TIFFIN, OHIO

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by
G. F. Hertzer

THE B. F. WADE CO., PRINTERS, TOLEDO

PREFACE.

NOTHING is claimed in this book pertaining to Styles of Fashions. It is true the fashionable parts of all the diagrams are taken from the latest Fashion Reports; but these will not last, and consequently the fashionable part is of little value. What I claim of my own work is the *BASES*, which must be considered permanent, and from which all changes must be made for different styles, or for abnormal forms. The principle laid down in this work, is: *To fit the form of men, making the change of fashions* to conform to the fit. The Bases I have adopted are new, in the science of GARMENT-CUTTING, and all calculations are based upon horizontal, perpendicular and paralled measures and lines. The slope of each shoulder, as $22\frac{1}{2}$ deg., is taken as a Base for a garment worn around the neck and shoulders, and the garments built downward from that Base.

All Bases are clearly defined by illustrations and description; and all gores cut out, or wedges put in, either natural or artificial, are minutely described according to the spreads or hollows of the body. The illustrations or diagrams are given both from a corner of a square, and from the center of a circle, with the same result.

I know that, after the publication of this work, some men will hew off some rough corners, and give it more polish; but this is the case with all inventions and new things, and I do not expect to be exempt from that rule. In fact, I know that this work is incomplete; but I can leave it to future time, either through myself or others, to take up the thread where I leave it at present, to unravel any mysteries that may yet be hidden. But the Bases and their application will remain, and will be so used in the twentieth century and thereafter, as long as clothing is worn and men retain their present general form. Some will no doubt say that certain of my methods cost extra study, all of which I admit; but cutting and making garments have been, are now, and always will be, a study; and so far, no man's life has been long enough, and likely no man's life hereafter will be long enough, to complete it. This work indicates the right direction for study, and does not allow the cutter's nor the tailor's brain to become dormant. My experience is this: Better study one extra hour over a garment than spend a whole day in altering it. The Merchant Tailor's success depends upon one thing only, viz: How he succeeds in pleasing his customers. Some cutters will ask for something definite in the shape of a new system; something that requires no study nor constant watching. To such let me say this: Whenever an infallible system of garment-cutting is to be invented, it must be something like a machine, which always does the same thing with the same result. Such an invention cannot be acceptable so long as the fashions and the styles are constantly changing. If, however, such a machine could become acceptable, the occupation of Custom Cutters would be "*forever lost.*" Nothing of this kind is claimed in this work, but *this* I do claim: that it is better and more practical, and far more comprehensive, than anything heretofore known. Neither do I claim that it will work equally well in the hands of every cutter, because no machine will work well unless directed and supervised by a skillful operator—one who knows every detail of its construction, and attends to it carefully.

I call this work a scientific calculation within both the square and compass. But I do not claim any knowledge of science, nor even of geometry, except perhaps what may be called "home-made." What little I know about geometry, I learned after I became forty-five years of age, and had begun to jot down my experience. Neither do I claim to be a Fancy Cutter; I do not even claim to be a Fancy Tailor; nor do I believe that I ever was cut out to be a tailor. But somehow I started to learn the trade, and when I was once at it, I made up my mind to learn it as well as anybody, even if it took me a few years longer perhaps than some others. Yet all of this is no reason why I should not be able to make a better survey of the human form than any other man has done so far; and in fact anyone, not a tailor, could have done so if his interest had been directed that way. It is a fact that the sewing machine was not invented, nor perfected, by tailors. It was accomplished by others, who knew nothing of tailoring, but they learned to make one good stitch in a quick way, and that was all.

I have been on the bench and cutting-board forty-four years, and I do claim that I have observed and learned something in that time which is worth while to preserve, and I have written it in language so plain that all tailors may understand. In 1878 I began to jot down my experience, illustrating everything by diagrams, and have up to this time written and illustrated each year two books like this, all of which I have in my possession and intend to preserve. I presume I could write ten years longer without exhausting the subject; but I feel the weight of fifty-nine years upon my shoulders and have come to the conclusion that I must clear away all old rubbish and publish what I know is reliable. This volume is the result. For the last ten years I have been carrying on a Merchant Tailoring business for the purpose of testing every garment which I cut. Any new idea that came to my mind I carried out by making a garment accordingly; and if I was wrong, and made a misfit, I made the necessary alteration. I could do this because I had no "boss" to curse me—I was my own "boss" and *I paid for the music.*

The above remarks are made to show that this work is not a mushroom idea, but based upon the experience of nearly half a century. For the reason that this century is nearly ended, and that, at best, this work will not be generally known, until the next century, I have named it GARMENT CUTTING IN THE TWENTIETH CENTURY. If any one doubts that I have been working for years to prepare this work, let him look up the "American Tailor" of December, 1883, and November, 1886, or the records of the Patent Office in Washington for 1878.

I will here say that this book has been written between working hours, or at odd hours, or days when I had the time to spare, and that from time to time the manuscript had to be changed as well as the diagrams, and then revised again. This has been the case from 1878 down to the present time. I do not wish to convey the idea to any one, that the Bases, as laid down in this work, were caught on to in one great lump and that this work is the result of the grasping of one great idea. When about eighteen years of age, I came to the conclusion that no system of garment-cutting, then existing, had an intelligible Base to work from, and that all so-called Bases were nothing but imaginary lines, to suit this or that cutter's fancy, and this is the case to-day. That being my conclusion, I tried to find something on which I might have a better hold.

Like Columbus, I had an idea that there was something beyond, but had no conception of its form. Of geometry I knew nothing, except, that "a square is an angle of ninety degrees, or the fourth part of a circle," but I found that I was helpless without geometry, and, at so late a day for me, I had to roll up my sleeves, as it were, and learn at least enough of geometry as this work requires. (Who will throw the first stone at my ignorance?) After I was able to divide the circle, the Bases, as laid down in this work, were gradually adopted, one by one, and so arranged that they harmonize with the slopes of the body. I have a hold now, and I can always tell whence I came, and whither I am going. I have a starting point at the center of a circle, I can tell that I sink my shoulders twenty-two and a half degrees; that the center of back and the center of front rest on one angle of one hundred and thirty-five degrees; that the front of armhole is forty-five degrees from the front, etc.; all of which may be understood by the whole civilized world. And if some cutters and tailors do not understand it, they can learn it in a few hours, and can learn it as quickly as they can any other rule.

It may be asked, can such angles always be drawn correctly? to which I will answer: No, not always; but it serves the purpose. Our grocer never sells us an actual pound of coffee, nor does our dry goods dealer sell us an actual yard of calico, but what they sell us is as near as they can come—it serves the purpose, and everybody is satisfied. The variations of the lines from the center of a circle are not greater than are the right angles from a square or from a straight line.

I have been advised to write this book as though it were written by a person residing in a large city, but I do not deceive any one, and admit that at the present time "Tiffin" has only about twelve thousand inhabitants, but that it is located in the big State of Ohio, and that Tiffin has more natural "gas" than New York and Chicago together. I do anticipate the question, "How much knowledge may come from a small city like Tiffin?" but I console myself with the fact that a like question, "*What good can come out of Nazareth!*" was asked two thousand years ago, and it has been answered in favor of that little village, and to-day these questioners are regarded as a set of conceited asses.

Advanced ideas do not necessarily come from large cities, or come to a focus there. Moses, the great law giver, caught his inspiration while among his flocks; and so did the poet, King David. St. John, the Baptist, and Christ himself took to solitude in the wilderness before entering upon their mission. St. John, the evangelist, wrote his Revelations on the lonely island of Patmos. Dr. Luther formed his reformatory ideas within the walls of

a cloister. The great emancipator, Abraham Lincoln, no doubt caught some of his ideas while working on a flat boat, or while splitting rails. In the face of such facts, I do not see why a common tailor, living and working in a small city, cannot have some advanced ideas about GARMENT CUTTING, even if they are written down without a perfect knowledge of English grammar.

I was born in the village of Niederwillingen, in the Principality of Schwartzburg, Sondershausen, Germany, on the 10th day of April, A. D. 1833. I received a good common school education. In the spring of 1848, when the revolutionary cannons were shaking Germany for freedom, I was sold as a slave (apprenticed) for three years to learn the tailor's trade, and came to America on the 17th day of September, 1852, then but nineteen and one half years old, and have never had any schooling in the English language,—but what I know I have picked up here and there, in the tailor's shops, stores, lodges and churches. For this reason, this book may contain words which might have been different, but it is written plainly, and in such terms that tailors and cutters will comprehend.

During the year 1891 I have worked mostly on this book, comparing diagrams and writings, and changing anything that I thought would improve it. But I find that if I keep on comparing and trying, I shall never be done, for I always find something else to write. A little over a year ago, I thought I would go to work and cut it shorter, the manuscript then having about fifty thousand words, and now it contains about one hundred and twenty thousand words. This is the way I have cut it shorter. But I do not see what I could strike out again, even if I should make the attempt.

G. F. HERTZER.

TIFFIN, OHIO, MARCH 2D, 1892.

SCALES AND MEASURES.

ALL dimensions mean numbers of the scale, unless specially called inches or referring to the size.

All scales are one-half breast or one-half seat, and two and one-half inches, divided into twenty even parts. The two and one-half inches addition to the one-half breast or seat measure makes the small sizes large enough and the large sizes small enough for all purposes.

Take the breast measure over the vest for both undercoat and vest.

The circumference measure of the breast and seat must be taken tightly over the vest and pants. The breast measure is to be taken with the tape touching the extreme point of the shoulder blade, with the lungs empty. The seat measure must be taken over the largest part of the seat, which is about three to three and a quarter above the fork or junction of the legs.

The half coat as well as the half pants take up about one and a fourth inches for seams, leaving about one and a fourth inches slack for other purposes on the half garment. This measure is to be taken with a small tape, and all the diagrams are calculated accordingly.

In taking a measure around the human form, there will be found a difference of from one and one-half to two inches between a narrow tape and a strip of cloth ten inches wide. The narrow tape cuts deeper into the flesh, and therefore will record less surface measure than a strip of cloth ten inches wide. If we take a narrow tape and a strip of goods, say ten inches wide, and with both measure over the seat or chest, drawing one as tightly as the other, we will find that the broad strip will record about one and a half inches more on the whole circumference. Now, if the broad measure gives three-fourths of an inch more over the half breast than the narrow tape, then it follows that, after sewing seams, there will be left half an inch on the half frock coat only for expansion of the lungs and the movements of the arms.

The same is true of the pants, and though they require nothing for expansion of lungs or movement of the arms, yet it requires a certain space for expansion while sitting, for it will be found while a person is in that position his seat, hips and waist will expand anywhere from one to five inches, but the waist will expand the most. The seat, hips and waist require their circumference measure while sitting—nothing more nor less—and, consequently, seams must be added to that measure, and must be applied at the point which I have termed "the seat line," as shown in Dia. XIV., and on the back on the upper line. If stitches are drawn in, on that line, it will be found that when the pants are on the body said line is a horizontal one all around, and at the largest part of the seat.

A large and fleshy person, particularly one with an extra large abdomen, cannot be fitted with the old maxim, viz.: Make the half-waist one-half the measure and add three-fourths of an inch. This usually holds good as to persons with small waists, who do not spread much in sitting, but when a large-waisted person, who perhaps weighs 250 to 300 pounds, assumes such a position, his legs will press his stomach upward, decreasing it in length and expanding it in circumference. There may be persons with sole-leather stomachs who can stand any pressure for a short time, or while taking a meal, but when compelled to sit most of the time, they want their pants large enough to be comfortable while in that position. It is true, such pants must hang loosely while standing, and must be supported by suspenders, but this difficulty cannot be overcome.

This work takes the seat measure as a guide to select a scale, no matter if the hips are larger or smaller than the seat; nor if the waist and hips are larger than the seat, proper allowance must be made there. And it should be observed here that whenever the hip measure is larger than the seat measure, it may be concluded at once that said large hip measure is caused by the unusually large abdomen directly in front.

In regard to the taking of measures close or tight, the following must be observed: A person may be measured over the breast very close, like a stove pipe, and will not object to that pressure, for it lasts only a short time; but subject him to that pressure for five minutes and he will not endure it. He *cannot* endure it, and the pressure would be still more intolerable if the tape should be ten inches wide. It is very important for the cutter to know *what* he is measuring, and *with what* he is measuring. Old and experienced cutters have learned this at

much cost, therefore young cutters should be told this in the beginning. Young cutters should be instructed to always request their customers to remove their coats at the time of measuring, and take the breast and waist measure from behind, because the breadth of the two will not always agree.

To obtain satisfactory length of sleeve is often a difficult job. There is the style, then the notion of the cutter, then the notion of the customer, and lastly the notions of the wife, mother and aunt—all of which frequently have a word to say in the end. Therefore the best of cutters are often obliged to alter the sleeve length. The young cutter should locate for himself a permanent mark at the wrist, so that he is able to take such measure always the same, and whenever he finds that his sleeves become too long or too short, he can readily make the necessary change in measuring. But to obtain a thoroughly satisfactory sleeve length, the cutter must know at what point to transfer the measure to the cloth. Different systems produce different sleeves, and the seams are located differently. The sleeve, as given in this work, has its centre at eight on the back, and there the sleeve length must be transferred, no matter where the seam is located; for if the back sleeve seam is further down, and the sleeve length is transferred at the seam, then the sleeve will become too long, and *vice versa*.

The angle of one hundred and thirty-five degrees, cut from a piece of pasteboard or tin, and as large as both shoulders, is a very important measure, and should be applied as shown in Fig. I. I do not claim that this measure can always be taken exact even over a good-fitting coat, but it can be taken with as much certainty as the breast measure, and it serves the purpose.

To measure the slope of the shoulders, the angle must be adjusted at the highest points of both arms at the side of the shoulders, and if the sides of the neck extend up higher, or lower, that amount is to be noted down, and it will be found that only extreme cases require alterations. Extreme cases, and I should call all such in which the difference is three-quarters higher, as on low shoulders, or that much lower, as on high or square shoulders. No attention is to be paid to the variation, if it is only one-quarter inch more or less, as in fact the sides of the shoulders, at the arms, are not to be fitted as close as the body itself indicates. It may not be out of place to mention here how to draw that angle of one hundred and thirty-five degrees, for it is a new measure and an unknown quantity to the great majority of cutters at present:

Form a right angle; from its point draw a circle as large as you can, and form two points, as shown in Dias. XI and XII; draw a line from the starting point to the second point of the circle, which will make one angle of one hundred and twenty degrees, to which is added fifteen degrees in front, to make the angle of one hundred and thirty-five degrees. The fifteen degrees are two lines spread one-quarter of their length, as a part of a circle twenty inches long and five inches wide. The angle of one hundred and thirty-five degrees is also one square, and one-half square, and may be found as follows: From the center of back and through the starting point draw a right angle, as shown by the front sleeve bases in all the diagrams, and on that line, go down, and square across and forward at equal distances, say twenty inches, and through that point draw the front line of the angle of one hundred and thirty-five degrees. Forming a right angle, and marking each line at equal distances, and drawing a line through said equally distant points, is equal to cutting a square in two from point to point, and consequently, said points will form an angle of forty-five degrees. The square contains ninety degrees, and the half square contains forty-five degrees, and the whole of it is *one hundred and thirty-five* degrees. (See Dia. II-A.) In all cases where an angle is to be found, the dimensions should be taken on a large scale, because on a large scale the variations are less than on a small scale.

The form of Dia. I is correct, and may be used as an instrument to measure all shoulders, and the edges of the angle should not be less than eight inches and may be drawn out more. It should be large enough to reach over both shoulders of a full grown person. The application and the use of said angle of one hundred and thirty-five degrees is fully described elsewhere.

How to make a scale: Take one half breast measure and two and one-half inches, in all cases, and divide the result into twenty equal parts. The common inch will produce a breast size of thirty-five, and the same for the seat size. Seventeen and a half inches is one-half of thirty-five, and the two and one-half inches make the twenty units for size thirty-five.

To make the larger or smaller scales: Take the half-breast and two and one-half inches; mark the half, the quarter, and the three-quarters of it, and divide each quarter into five equal parts with a compass, and then divide each unit into halves, quarters and eighths. A cutter should always know just what his scale contains, and should in all cases be able to make his own scales.

The use of fractional scales is not necessary. If the measure indicates a somewhat larger size, say thirty-six and a half, take a scale of thirty-six for a short person, and do not cut away the chalkmarks in width. If the person is tall, take a thirty-seven scale and cut away all the chalkmarks in width. Ordinarily, make small chalkmarks and cut them through in the center. Material which requires large seams should also be cut on the outside of the chalkmarks. It is an easy matter to cut a garment one-half size larger or smaller, without using fractional scales.

A set of scales will accompany each copy of this work; but any graduated set of scales can be used. All we have to do is to select a scale which contains one-half breast and two and a half inches, in twenty units. Such selection may result in a fractional scale by some, but it can be used. There is no other system in existence by which a foreing scale can be used, and give satisfactory results. (See article on "*Scientific Calculations.*"

PANTS.

SCALE: One-half seat measure and two and a half inches, divided into twenty parts. Form an angle of seven and a half degrees, and mark it ten numbers wide, at a length of eighty numbers, or one-eighth of its entire length.—The angle of seven and a half degrees has a width of one-eighth of its length. At the top of said angle, or at the width of ten numbers, start the top of pants, and go downward ten numbers for the fork or crotch, and continue downward a distance of thirty-two numbers from the top; again mark eight numbers from the top, or two numbers above the crotch; at the points eight and thirty-two is an even division for the purpose of dividing the angle of seven and a half degrees into three equal parts, or two and a half degrees each; at eight go sidewise three, six and nine, and forward three; at thirty-two go sidewise two, four and six, and forward two; strike lines through two and three, four and six, and six and nine sidewise, and through two and three forward. Each line will represent an angle of two and a half degrees. Except for equal divisions, points eight and thirty-two have nothing of importance about them, neither has the line through four and six, which is also only an even division of the angle of seven and a half degrees in three equal parts; but it will be seen that the angle of seven and a half degrees spreads one-eighth of its length; consequently it contracts one inch in eight, and four inches in thirty-two; hence the width of the angle of seven and a half degrees is six inches at a length of thirty-two whenever it is ten inches at the starting point.

The front line of the angle of seven and one-half degrees I use as a base to work from, but either one of the other lines would be just as suitable a base, particularly the line from two and three sidewise, which is to be the center line of the pants leg, and from which line a right angle each way will be nearer horizontal than any other right angle, when the pants are on the body. Consequently it is a good line to square from for both a level top and a level bottom; but for reasons hereafter explained, it is not a *sure* line to square from to nick the seams when the foreparts are cut smaller and the backs wider; in fact, no square line is sure for that purpose. But a sweep from the point of the angle of seven and a half degrees will make true connections at any point, no matter how narrow the front or how wide the back may be, or if both be even.

After having formed the angle of seven and a half degrees, and having it divided into three equal parts (or in two and a half degrees each), two and a half degrees, or one part, is placed in front of the angle of seven and a half degrees for the crotch or fork. The seven and a half degrees furnish the outside of the pants leg—that is, one front, one side, and one back, except a small fraction of say three-quarters, which is thrown forward on the top of the front of waist, and is further explained elsewhere.

The top and the front edge of all pants is about one-eighth of the whole waist measure, taken close. But if the question should be asked why it is one-eighth of the close whole waist measure, I must say that I can not give any other reason than that it has proven true in years of practice.

The angle of two and a half degrees forms the crotch, to which is added about one and a quarter for dress and extra straddle—as shown in the diagram. The angle of seven and a half degrees, with a width of one-fourth seat and one and a fourth inches, or ten numbers, at the top of waist, will produce three-fourths of one leg; and the angle of two and a half degrees added to the angle of seven and a half degrees will produce the fourth quarter, or enough to cover and to fit one leg, the whole being one angle of ten degrees.

Whatever fashion, or notion, or a larger boot or shoe, may require further at the bottom, must be allowed equally on each side and inside; and again, whatever the forepart may be decreased, must be allowed on the back. Or, in other words, the seams are not placed in the center of either the outside or the inside, but more to the front.

The angle of seven and a half degrees forms the top of the side on a straight line, and the back has from one to one and a half inches gore cut in its center. This gore, however, may be better divided into two small ones—one in the middle of the back and the other at the side seam. The back is sloped off fifteen degrees from the seat line upward, as shown in the diagram. The width of the angle of fifteen degrees is one-fourth of its length, and to draw it, go up ten numbers and sidewise two and a half numbers. Three and a fourth numbers above the crotch is the so-called seat line, from which point the top of the back is sloped off fifteen degrees. The seat line, as shown in Dia. XIV, is a horizontal line over the largest part of the seat when the pants are on the body, and there the seat measure must be taken. It must be taken as tightly as you would measure a stove pipe, or else the pants will become too large.

The angle of seven and a half degrees, with its width of ten at the top of the waist and the back slope of fifteen degrees taken off, and the back seam formed as shown in the diagrams, will produce the two seat lines about nineteen and one-half numbers for the dress side, of which must be used about one and one-quarter inches for all seams, leaving three quarter inches for extra width over the seat for the half pants, which is enough.

Elsewhere it is explained why a narrow tape will record a shorter measure around the fleshy parts of a person than a broad strip of cloth, say ten inches wide. It should also be observed that a broad strip of material, drawn around the seat while standing, will record, say about one and one-half inches more than a narrow tape half an inch wide, both being drawn with the same strain. When a person is sitting, the length of the abdomen contracts, but increases in circumference, and may expand anywhere from one inch, in a person of light build, to five inches in one that is quite fleshy. Therefore, while in a sitting position is the time to make a correct circumference measure over the seat as far as such a measure can be taken, or as far as a correct measure is actually necessary for cutting a garment. This measure, if transferred to the seat line, requires no allowance except for seams. When a person assumes a sitting position, his entire body is on a strain. The seat and abdomen grows very rigid, and in this condition a more correct measure may be taken with a narrow tape. If a pair of pants should be made up as large as such a measure, it will be large enough for a close fit, providing all other parts are correct. There is no question but that a trifle surplus cloth at this point, allowed at the side, will be quite in its place, and will never come amiss, but instead contribute to the comfort of the wearer.

By taking into consideration the sitting or standing position of the body, in connection with the circumference measure of the seat, it is absolutely necessary that the location of the seat line be positively known when the garment is apart and spread upon a flat table, like a pattern. Always bear in mind that the seat line in front will be three and a fourth numbers above the point of the crotch and about two and a half numbers higher on the back, or whatever the spread of the angle of fifteen degrees across the back may be. When the pants are on the body, this extra length in the back of the pants will be taken up in winding around the seat, and pushing backward and downward with the seat; and whatever that takes up must be allowed again on top, as shown in Dia. XIX, or must be obtained from below, as shown in Dia. XIV, which shows the true length as far as necessary. But another inch may be added to the length on the top of the back, in order to make the back that much higher than the front when on the body. In Dia. XX, this extra height of the back is four numbers, and is a permanent thing, even if a larger waist requires the front to be higher. Raising the top of the front for a large-waisted pants is caused by the same principle as raising the top of the back, only less prominent. As the seat requires extra length behind, so does a larger abdomen directly in front require extra length. Hence, large-waisted pants require some extra width at the top of the side in order to throw the fore-part forward and downward, forming a curve over the front of the abdomen; and, that length being supplied from the top of the front, the same must be allowed again from where it was taken. By extra width on the top of the side, I mean an extra width outside of the angle of seven and a half degrees, which is to be the portion thrown forward, and need not in any case be more than an inch. The same amount is enough for the extra length on the top of the front.

To regulate the waist of pants, it is necessary that the waist must be made as wide as the measure indicates when the person is sitting, and it may even be wider if a customer so desires. Some individuals are very sensitive around the waist, and for such pants it will be better that they be two inches too large there, than half an inch too small, or even a close fit. In no case should an extra waist proportion be allowed behind, unless it is to be buckled up or to hang loose; for if it is to be used to supply the waist proportion in front, it must necessarily be drawn forward, consequently will wrinkle the whole pants, and may produce tightness in the crotch. Surplus waist may be allowed behind, as long as it remains under the buckle strap, and such surplus will buckle up

straight. But if surplus cloth is allowed in front or at the side, and is drawn backward under the buckle strap, it will draw wrinkles across the seat. Pants too loose at the front or at the side may be all right as long as the wearer will carry them on his suspenders.

The angle of seven and one-half degrees, with the back sloped off fifteen degrees, and three-quarters allowed in front, must be considered a permanent thing, and within that space and along and around the hollow of the back of the waist, all surplus must be cut away in one or two gores, according to the measure taken in a sitting position. Surplus waist proportion is best allowed by a spring within the back gore, as shown in Dia. XXI, which will remain where it is cut and can not be drawn backward under the buckle strap.

Pants can usually be worn pretty close at the soft, or hollow part of the waist, but they must be plenty large as soon as they come in contact with the short ribs, and such width must be at the sides, as shown in Dia. XXI. Now, if the waist requires more, that amount must be divided into three equal parts, one part being added to the front and two parts to the side; so that when the pants are on the body, the whole will be equally divided,—one part in front, one part on the left side, and one part on the right. The waist, when it grows large, expands forward and sidewise, and extra waist proportion must be supplied accordingly.

The center line of the angle of ten degrees should be perhaps more fully explained. Said center line runs on and along the whole center of the leg when the garment is upon the body, unless, by some miscalculation it is drawn out of shape. From this line all bottoms and tops of the fore-part may be squared, and from it the top and front of the fore-part is one-eighth waist, actual measure. It forms the crease line, and from it the bottom is made an equal distance on each side. The knee also is formed from it as a center. But as the inside of the leg is a straight line and the outside of the leg is hollow at the knee, it follows that, for a close-fitting pants leg at the knee, the outside first requires a reduction of say three-eighths to one-half an inch, on double cloth, which again is allowed at the inside, after which the width may be reduced equally on each side, if such reduction is necessary.

The angle of seven and a half degrees runs in slope with the leg, though on a perfectly straight line, and if the pants leg is to be shaped in accordance with the shape of the leg, as it must be if a close fit is desired, then wherever the leg has a hollow the garment must be reduced, and wherever the leg has a swell the pants also must be enlarged. This is the case with all legs. The side of the knee should be hollowed out, while at the calf the side seam must run outward If the person be "bow-legged," then the outside must receive more cloth and the inside less, if the form of the leg is to be followed; but, as a general thing, bow legs in pants should be so formed that the inside is pretty full, in order to hide such a deformity. So-called "knock knees" require more cloth on the inside of the knee, and therefore more must be taken from the outside. Knock knees are not so much a deformity as bow legs, and such pants legs may be cut and made according to the shape of the leg.

There is one more bend in the leg which requires mentioning here, and that is the knee itself. A close-fitting pants must have the shape of the side of the leg and the shape of the knee in front as well. If the pants leg is not cut or worked according to the knee, the knee itself will work it out by stretching the front or wrinkling the back. By fulling the fore part one-fourth to three-eighths of an inch over the knee, and "fulling" the same on both seams, the whole difficulty will be overcome. Or, what is still better, stretch the back that much. If this is to be done correctly, it must not be left to the sweet will of the pants makers to stretch or shrink as much as they please or where they they please, but everything must be distinctly notched, say five inches above and five inches below the knee.

This is also true when you cut spring bottoms. Spring bottoms have come and gone regularly for the past forty years, and they will soon come again, and when they come again some cutter or tailor will be glad to know something about them. When spring bottoms were first introduced they were made with a piece or wedge set in the center of the fore part, on the same principle as leggings are made to-day, but it was soon discovered that by allowing that wedge on each side of the back, and by stretching the sides of each fore part toward its center, the side of the fore part would spring forward, and the wedge added at the side of the back filled the vacancy at the stretched side. If there could be a seam in the center of the fore part we would simply add say one-half to three-fourths more on each seam in front, and the spring would be there; or if we could cut our fore part to a point at the bottom, leaving the whole width at the back, the spring would also be there, and all without stretching or shrinking anything, because the spring would be cut where it belongs. But style and economy of material require all seams to be at the side, and for the reason that the spring must be worked toward the center of the front, all such fore parts must be as narrow as possible, because a narrow fore part of six inches will stretch more

easily than a fore part of eight inches. Now, in springing the bottom and forcing both seams of the fore part forward as a spring, all must be done by stretching the sides of the fore part before the seams are sewed, and in such manner that the fore parts will fit into the spring on the back. It will be of no practical use to do the stretching at the sides but a part of the way, and attempting to force the spring forward by shrinking the center of the front, as all such shrinking will return. Nor will it do any good to hold the back full on the fore part, and sew the seams, and then attempt to stretch the fore part; for, even if the stretching could be accomplished in this way, the sewed-up seam would soon draw back, because a sewed seam, and particularly a machine-sewed seam, can be stretched but very little, and if it does stretch will soon return to its former condition. The stretching of the side of the fore-part must also be alike on both sides, as well as alike on both legs, or else the springs will not run in the same direction; or they may not spring to the center of the foot, but to one or the other side. The stretching must also be done as far down as possible, and must never be started higher than about five inches above the bottoms, all of which must be indicated by correct nicks in the front and back.

All nicks, and particularly on pants, should be cut small and distinct. It would be best to make just a small, straight cut; and the maker should be required to put them together with the utmost precision, and not one side a quarter of an inch up and the other a quarter of an inch down. Why I claim that the nicking and putting together are very particular features regarding pants, for this reason: All parts of pants are very long, and while a small twist, say in the sleeve of a coat, may not show much, the same twist will show plainly in a pants that is three times as long. In order to convey a correct idea of what I mean by the term "twist," take a pants pattern and pin it together at each side of the bottom, then throw it out of gear, say one-fourth of an inch at the hips, and see what twist will be at the whole length.

Now, the foregoing points are figured down pretty close, but figuring on paper and practicing on garments are two different things. Fine garment-cutting and making are something more than can be learned from a multiplication table. It requires a practical knowledge of what a customer really requires, and what he ought to have; it also requires practical knowledge of the proportions of the different parts of a garment. It is, for instance, of little importance if a pants leg is half an inch larger or smaller, so long as the garment hangs nicely when on the body, and the bottom corresponds with the knee and thigh, and so on—all of which is something that cannot be learned from the books. If a cutter is what may be termed a "natural-born" cutter, all such things will come to him; but if he is not so gifted, then he must train himself to it, and in no other way will he succeed as a cutter.

On top of front, the pants diagrams are thrown forward from five-eighths to two numbers. Persons who stand very erect, and have small waists, have enough if one-half is thrown out. Large waisted persons stand naturally very erect, and a form of forty-four seat, and forty-six waist, made up, can be fitted with one and one-half, while two numbers, like Dia. XX, is enough for forty-six seat and fifty waist, made up. Forty seat, forty hip and forty waist, made up, can be fitted with one and one-fourth, and the same is true of thirty-seven seat and thirty-seven waist, made up, all such waists to have the angle of seven and one-half degrees complete at the side, or even one inch allowance, as per Dia. XX. The gore in the back is to be one inch at the top of fore-part and running out to *nothing* at the top of back, and which may be called extra looseness, but which can not be drawn backward under the buckle strap, but will remain at the side and prevent the waistband from striking the short ribs.

Outlets on the waist of a pants would do more good if left on the top of side, running out to nothing at about line sixteen, but the outlet, if left on there, requires too much work to let out, and the outlet is usually left on behind. When such a crotch must be let out, the back crotch seam from line sixteen upward, should be stretched upward say one-quarter to one-half inch, and the whole back seam, above the crotch should be stretched, as much as possible, and that may easily be stretched one full inch, and the stretching should be done mostly at, or near, the seat line, and as far sidewise as possible, and if the seat is lined and the lining is straight, and will not stretch, a wedge must be put in the lining, as shown on the outside of Dia. XVIII. The outside can almost always be stretched any amount desired.

Stretching the back thus, the outlet, left behind, will fall sidewise, where it really belongs, but when said outlet is simply let out behind, it will remain behind, and must be pulled forward, and even if the pants feel wide enough at the waist, the wearer may not feel at home in them when sitting down. On the other hand, when pants have too much seat, but not too much waist, the best way is to rip up the side seam, from line sixteen upward, and stretch the side of the back, say one inch, and cut it off on top, all of which makes the seat shorter

behind. Stretching the side of the back upward from the side of the crotch is equal to cutting a larger gore between the front and back on top of side, and allowing it behind. If the pants are lined in the seat, or all the way down, a large fold should be laid in the back lining in place of cutting it in as some do, to imitate the gore, or as others do, who baste the lining flat over the gore, whereby the effect of that gore is destroyed. In short, all linings in the pants should be put in plenty large on both back and front, both in width and in length, on the same principle, as the lining in the back of coats is put in large. The larger it is, the better it will be. The outside of a pants mostly stretches, but the lining does not, and often shrinks from the moisture of the body.

If we should cut two pairs of pants over the same pattern, and make one up with, and the other without lining, we would find that the one without lining feels the larger when on the body. All pants lining should be cut bias.

To shape the crotch seam Dia. XIV should be observed, especially when the fore part is to be cut larger and the back that much smaller, which sometimes may be done to advantage, and may enable the cutter to cut the back without much piecing. In the shape of Dia. XIV the seam may be thrown anywhere, without losing the balance.

Some years ago, Mr. J. B. West brought out what he termed a new style of pants, by cutting the front fork larger than the back fork. But that new style did not last long, for the reason, I suppose, that most of the cutters did not get the points of the forks correct. There is no question but that it can be done satisfactorily. The only objection I could make is this: When the inseam is thrown too far backward, the dress part on that seam locates too far backward, while really the dress requires to be located as far forward as possible, and for this reason I have the undress fork located, near the angle of ten degrees, and it may be made just even with that angle, and all other width allowed on the back.

If for any reason it is necessary to cut a pants with a very large fork on the front, and a small fork on the back, the pattern should be cut like Dia. XI, but the fork should be spread so that whole can be cut without piecing; whereby the crotch seam can be thrown anywhere, by the help of the sweep from point 80, without losing the balance. If the cutter is able to cut that seam anywhere, it may save him a great deal of piecing where such piecing is not desired.

THE ANGLE OF SEVEN AND A HALF DEGREES FOR PANTS.

THIS angle must be further explained. Although I am using the angles two and a half, ten, fifteen and twenty degrees for cutting pants, the angle of seven and a half degrees is the main angle, because it corresponds more nearly to the slope of the legs, at the outside, than an other angle, and the combined outside slopes form an angle of fifteen degrees. I do not claim that the outer sides of a person's legs actually slope fifteen degrees. In fact, I know they do not, but they come near enough to that to be practical for garment-cutting. It may be fourteen or sixteen degrees, and it may be even more than that, as on short and large-waisted forms, or it may be less than that, as on tall and slim persons, but fifteen degrees is the sixth part of a square and is easily found by spreading two lines one-fourth of their length. Going up from a certain point one yard, and across one-fourth yard, will make the angle of fifteen degrees. By placing a straight edge on each side of the body, on and along the slanting side of each leg, they would form an angle of fifteen degrees. These slopes are certainly the longest and straightest lines that can be drawn on the human form, and there is no reason to contend that they are not good lines to use as bases for cutting pants. The longest and straightest lines are always the best to be used as bases to work from for almost anything. Within these two lines, representing the angle of fifteen degrees, is contained the whole pants, providing the proper circumferences are obtained to go around the entire body. Wrapping a sheet of paper around the body will give the correct idea of what I mean. There is the slope of fifteen degrees, and there is the circumference around the whole body, and represents a cover for both legs as though they were one.

Pants are cut for one side of the body, but on double cloth; so we make our calculation for half of the body only. If we shape that sheet of paper according to the form of the body, it will represent a slope, on the sides, of fifteen degrees, while a straight line in front and center of the body will divide the angle of fifteen degrees into two equal parts, or seven and a half degrees, on each side, which seven and a half degrees are used as a base for this garment, representing a cover of three-fourths of one leg, viz.: one front, one side and one back. The inside of the leg requires as its share one-third of the whole outside, and as the whole outside is the angle of seven and a half degrees, it follows that one-third equals two and a half degrees, which latter, attached to the angle of seven and a half degrees, forms one whole angle of ten degrees.

This angle of ten degrees, with its proper width, will cover a bare leg, and if it does not exactly fit it, it will at least represent the same slopes, and by these, reductions at the knee and additions to the bottom can be made. For the point of the double dress fork one and one-eighth to one and one-quarter is to be allowed, outside of the angle of ten degrees, and three-eighths less for the double undress side, and whatever the forepart is made smaller is allowed again on the back. The points of the forks must be so constructed that they all rest on the same sweep, as shown in Dia. XIV, unless the front and the back are made extremely wide or narrow, in which case the points can not rest on the sweep, but must be put as shown in Dia. XIV. The allowance of one and one-eighth to one and one-quarter for the double dress fork is simply an average quantity and one is enough for a close fit, while a very loose fit, or open cut, may have one and three-eighths allowed. That part of the pants can not be t to fit close to the body, but must always have some loose cloth there, but it must be cut so that it will hang

straight. Years of experience have taught me that one and one-eighth to one and one-quarter is a good average. The same cause, which requires the front of the waist to be thrown forward of the base on $7\frac{1}{2}$ deg., requires the addition to the fork, and to the angle of 10 deg., and the normal form requires about the same amount at the waist and at the undress side. If the front base were moved forward to the front of waist, the angle of 10 deg. would also move forward to the half undress fork. The extra allowance for the dress fork must be considered independent of the body, as it is a one-sided affair.

For a close fitting leg the angle of 10 deg. may have an allowance of $\frac{1}{4}$ double at the inside of the knee, or the forepart may be placed on the base, and $\frac{1}{2}$ allowed on the back, and a larger leg may have anything more, which a nice slope of the seams allows, but which in no case may be more than $\frac{3}{4}$ to $\frac{7}{8}$ on the double. Large spring bottoms will have to be considered as close fitting at each seam, and the springs thrown forward by stretching the side seams.

The side of the knee may be hollowed out $\frac{1}{2}$ on the double, and in this case may be considered as that portion which is thrown outward on the inside, in order to give the pants leg the natural slope of the body for both inside and outside. For a large leg the side of the knee may have anything more which is consistent with a nice slope of the side seam, starting at the seat line. The above description of a close fitting pants leg at the knee will hold good on a few sizes only, say from 35 to 37. Larger sizes must be reduced more and require less than the angle of $7\frac{1}{2}$ deg., as seen in Dia. XX, and smaller sizes must have more width.

If a large size is to be fitted with a close-fitting leg at the knee, the best way to obtain the correct points is to take the center line of the angle of 10 deg. as a point to measure from, and give the double inside $\frac{1}{2}$ more than the double outside, which will be the same as the above calculation for a medium size. As stated elsewhere, the allowance on top of front of the waist to the angle of $7\frac{1}{2}$ deg., and to the fork and to the knee, is caused by the base being located $\frac{3}{4}$ to the side of the center of the body.

In a standing position the base would locate at the supposed inside edge of the front of the leg, but it must be considered that at each step the center of the whole upper body is thrown upon the center of the standing leg, and consequently the bases of a pair of pants change at each step, and the pants is required to set reasonably well in all the different positions in which the leg may be thrown, all of which can only be accomplished by extra width in the fork, and which may be termed the balance of a pants. If said balance is not correct, the pants leg will make a kink or throw a fold somewhere upward to the knee.

This fault of pants can be seen in the muddy streets of a small town, as well as on the fashionable boulevards in large cities, and are even shown on fashion plates. Such may be in style by some reporters of fashions, but I never did like them, and I do not suppose anyone else does, but somebody must cut and make them as long as they are so shown on the fashion plates.

This question will always have to be considered by cutters, and it cannot be explained too much. Careless nicking of the seams, or carelessness in bringing the nicks together when the legs are sewed up, will also cause a twist in the legs, one way or the other. Pants legs which draw from bottom of inside, up and forward, to the knee, may be changed either by giving more width at the inside of the bottom, starting at the fork, or by reducing width at the top and front of waist, and running it out gradually below the knee. If the reduction of the front of the waist makes the waist too small, allow behind what is taken off in front.

If anybody will go to the trouble to open his own pants in front, and draw the front sidewise and the side backward, it will be seen that that twist from the inside angle to front of knee will form, and by twisting the upper portion a great deal, the twist will form all over the leg. Now, if a pants forms that twist itself, it shows that the pants must be altered contrary; that is, by reducing the front and allowing behind, or in other words, by twisting the pants waist from the side forward and from the back sideward. How far that twist is to be made depends upon the condition of the pants, also how far down it is to be made. As to the amount of changing such a pattern or system is not for me to say; I can only point out the way to alter, not the amount. Such pants, when made up, are hard to alter, but by knowing how to alter them, a cutter can, at least, change the next one.

The thigh proper would not require $1\frac{1}{4}$ addition for the dress side to the angle of 10 deg., but the legs at the fork do not join closely, but are about $1\frac{1}{4}$ inches apart, and at this point, and in front of the thigh, there is a hollow which is partly filled out with the sexual organ, which must be provided with extra cloth, commonly called "dress" in tailors' language. The hollow itself forms a bridge from one leg to the other, and for the purpose of fitting pants, cloth to cover that bridge must be allowed for each leg, and is put down in this work as an allowance

of $\frac{3}{8}$ to the double angle of 10 deg. for the undress side. This allowance for the bridge is made on the same principle as the wedges are, which are put in between the fingers of gloves, and which allow the fingers to move in any direction.

At line 8 the dress fork is placed at $1\frac{3}{4}$, but $1\frac{1}{2}$ is enough for a close fit, and the dress fork and the back should be even at line 8. The back is even with the front at line 8, and the half dress fork at line 10 is made larger or smaller according to the width at line 8, all of which constitutes the difference between the open and the close cut at that point.

Now I must say something about the $1\frac{1}{4}$ thrown forward on top of waist, as in Fig. 1. This $1\frac{1}{4}$ is for such forms which throw their front of waist, say $\frac{3}{8}$ forward of a straight line, running parallel with the front slope of the legs, and which is forward on top, and which forms may be called forward leaning waists, but the variations are so great that no positive point can be given; but in order to have something for a standard, I have put it down as $\frac{3}{8}$. The $\frac{3}{8}$ forward growth of the top of waist and the $\frac{3}{8}$ from the base to the center, make a combination of $1\frac{1}{4}$, and any waist which leans considerably forward, or any waist that is near as large as the seat, requires that amount. All that which has been said above about the amount to be thrown forward of the base for the normal form, as in Dia. XIX, is independent of any consideration for a large waist, and which is further explained in the Article on "*Pants.*" But I must add this: A large waist, though it grows forward from the back, don't locate itself forward according to the difference of the diameter from front to back on the same person, as it might be supposed. Whenever the waist becomes larger the body will straighten up, in order to keep in balance, and we can see many large waisted forms whose front of waist is no further forward than that of a small waisted form, and consequently require not much addition to the front, but to the side. Hence $1\frac{1}{4}$ thrown forward may be plenty for even a large waist, and I find that two numbers are about the most which any pants can stand, or ought to have. It would be folly to attempt to measure the amount in any shape or form, but all this must be made by guess, and it is fortunate for cutters that a quarter or even one half inch, more or less, will not kill the fit. (See description of Fig. 1.)

The angle of $7\frac{1}{2}$ deg. is formed according to the scale of the seat measure, and over that point the side of the pants may have the full width of that angle, while above (at the waist), and below (at the knee), the normal size requires a reduction. On the normal form the seat measure is the largest, and the hips are cut accordingly, and the waist and the knee are cut according to the measure, and it will be seen that whenever the waist becomes larger, the hips also increase, and if we want to cut the waist larger we cannot help cutting the hips larger also, and the hips will mostly follow the waist. It is true there are some extra large hips with small waists, and if this is the case, the hips must receive enough cloth, and to retain a nice slope of the seams, the waist should be cut down again by a larger gore in the middle of the back. Unless the hips and waist are larger than the seat, there is no need of going outside of the angle of $7\frac{1}{2}$ deg., but extremely small waists and small hips require a reduction over the side, the same as extremely large waists and hips require an addition. How much that may be must be left to the cutter, but I will give a rule which works both ways: On a normal 38 seat the hip may be 36 and the waist 34, which requires the full angle of $7\frac{1}{2}$ deg. at the side of line eight; and at, and above, the seat line, but a reduction of say $\frac{1}{2}$ inch at the waist on single cloth, and a small gore in the back. Now, if the hips should be 38 inches too, it is but reasonable to allow over the hips, and outside of the angle of $7\frac{1}{2}$ deg., the difference of such $9\frac{1}{2}$ numbers, at 4 numbers below 0, which is in this case about $\frac{3}{8}$ of an inch on both front and back. Still larger hips in proportion to the seat and still larger sizes can be calculated the same way, and though the rule would hold good in the case of quite small hips, the proportionately smaller hips are seldom found, and if found at all, will indicate a smaller waist, and the slope to the smaller waist will regulate the smaller hip, the same as a larger waist will regulate a larger hip.

Some persons are found who are very flat from back to front, and broad from side to side, but of normal circumference, and for such, the pants should be cut full at the top of side, and reduced on top of front, because they are mostly erect forms. In all such cases I would consider the backbone, at the hollow of the waist, as a permanent thing, and regulate the waist for any form at the front and side.

To obtain the correct shape for the depth of the crotch, is clearly shown in Dia. XIII and XIV, or in any diagram with a sweep from point 80, but we can not always go down to point 80, and the next best thing to be done is by squaring from the inside line of the angle of 10 deg. through point 10 on the front base, and it will result in the same thing. At the crotch all faults of the upper part of a pair of pants are recorded. If the pants

are too small over the side of waist or hip, the side of the waist or hip will seldom show it, because the solid hip will draw the pants up to the side, and the soft part of the inside thigh will be pinched and sawed by every step. We find plenty of men who will always direct cutters to give them plenty fork, because they always have their pants too tight, and when we look at such persons, we will find that they are always full grown at the sides of hip and waist. True, more fork will help such pants, but they will not set as good as if they were supplied with sufficient cloth over the hips. Too much cloth over the hips will not injure the pants, it will simply make them large there, but not enough will always bring on complaint.

For the following reasons, the base, or the front line of the angle of $7\frac{1}{2}$ deg., was not placed in the center of the front:

1st. The base would not run parallel with the front of the leg.

2d. The center line of the angle of 10 deg. would not run on and along the center of the leg, and consequently would be useless for the crease line.

3d. The center line would not be a reliable point from which to establish the center of the front, at a distance of $\frac{1}{8}$ waist, close measure.

4th. The center line would not be the center line for the knee for all widths.

5th. The center line, being used for the running of a stripe, would not run with sufficient correctness, at least not on the back.

All the positions of the lines, angles and bases are placed as indicated, because years of trial have convinced me that they give the best results. There is no way conceivable, that I have not tried, to adjust the angle of $7\frac{1}{2}$ deg. in order to bring the lines in harmony with the body—and the result is here given. What difficulties I have had, to obtain this result, it is not necessary for me to say, neither would anyone believe me, I suppose. But I do say, however, that I spent 8 years in the work of alteration, to adjust this angle of $7\frac{1}{2}$ deg. To some it may seem improbable that I would possess the patience and determination to succeed in solving the problem, and would stick to that determination for 8 long years—*but I did.*

Now, I will give a description of the seat and compare it with the front, and follow it with a description of the slope of the back, by which the seat is to be fitted. From the crotch forward the front tapers up, and forward, and the normal form can be fitted on a straight line, or with a straight piece of material, by simply turning the crotch backward, but it is not so with the back, or the seat (see Dia. XV). The seat turns in a different way, and from the crotch backward; downward first, say 1 to $1\frac{1}{2}$ inches, then backward, and then upward and forward again. A sheet of paper wrapped around the body will fit well in to the body of the normal form all around the front (see Dia. XV). At the side it will do the same all the way up to the thigh-bone, or the largest part of the seat. But on the back the sheet will not meet the body below, or above the seat, nor will the sheet touch the top of the side; and in order to bring the back to the body, below the seat, the back must be cut through crosswise, when the lower portion can be pushed in, and thus brought in contact with the back of the thigh. Thus cutting the sheet crosswise and below the seat will cause an opening of about $2\frac{1}{2}$ inches directly under the seat, running out to nothing at the side of the thigh, which opening, if minutely examined, will show an angle of 15 deg. This must be closed again by inserting a wedge by some means. This inserted wedge forms a sack for the seat, and is thrown downward and backward just as the seat itself.

But it will not do to cut pants with a piece across the seat, so we must create an artificial wedge by using the surplus cloth on the top of the side, and dipping it backward and downward over the seat, and inward to the back of the thigh. By so doing, the original back center is thrown over the line, and is cut off as back slope; and whatever the back has been thrown downward, and, has lost in length, is allowed again on the top, and is usually termed "extra length of back."

When the pants are on the body, both front and back are alike in length as far as the fit is concerned, but we may make the back an inch longer for nice appearance, and it is usually so done. That portion which stands off on, or around the back, on such a sheet, is reduced by one or two gores in the back. The extra length of the back is taken up by winding around the seat, and well-adjusted or well-balanced pants will always fit there. I claim that the angle of $7\frac{1}{2}$ deg., with an artificial wedge across the seat, will produce this result every time, as shown in Dia. XIV.

With the help of Dia. XIX, XX and XXI, there should be no difficulty in cutting a pair of pants that will be a pleasure to wear; but, as in all things, there must also be harmony between the cutting and making, and for

this purpose I will add, that all diagrams and patterns issued by a reliable publisher of fashions are calculated to be cut from nice material, which requires small seams. Their pants are to be made up without lining, which allows them to give in every direction; and they are also calculated to be worn over nice-fitting under-clothing. In fact, they are calculated for fine trade, and they are made by tailors, who receive about $3.00 pay per pair for making. Therefore, when such a pattern is sent out, and pants are made from cheap goods with large seams, and in all probability lined with heavy muslin, the result is, that the customer cannot wear them. Then, again, one cutter may perhaps allow a little extra here, and another allow a little there, and the pants in the end may be large enough—but where is the city style and the neat fit?

The same is true as to coats and vests. Reports of fashions are intended for *fine work*, and all that this term implies; and a cutter who uses such patterns to make a pair of pants for a man who works in a ditch must allow more fork and more seat length as well as more width for the upper body—all allowed on the side. Extra looseness for the upper body is best provided by allowing all at the side, where it may hang loose but smooth; but if the extra width is allowed in the fork, it will remain there on a twist, and it may even cut the seat, if only allowed above the fork. Allowing extra width above the fork is almost as bad as to allow extra width at the front of the armhole, which allowance would really make the hole smaller.

From the crotch downward the whole leg must conform to the slope of the angle of $7\frac{1}{2}$ deg., because the relation of the crotch and the ankles change very little except on deformed persons. Some persons may throw their feet a little further apart than others when walking, and the center of the body may be considered at the inside ankles, or one inch from each inside ankle, just as a person may place his feet while standing naturally. But when walking, the center of each half body is in the center of each leg, for by each step one leg makes the whole body must throw itself upon the center of the other leg, or else the body would tumble over. This can be best observed in slow walking, while by fast running it is not noticed. Any person who walks slowly throws his upper body more to a position of standing on one leg, than a fast runner, hence the slow walker is seen wabbling his head from one side to the other by every step, the same as a goose.

In this work the pants are calculated each leg for itself, and each leg has its own base; and they are so adjusted, that a person can stand, walk, jump, run, sit, etc., and it must be understood that when a pants is on the body the base goes with the leg, so that the base runs straight down when the person makes a step, or when he stands on one leg; but when he stands on both legs the base will naturally run a trifle sidewise at the ankles, and consequently a true plumb line pant base can not be found, except for one position of the leg only, and the position of the bases, as given in this work, are as near correct as any can be established, and from which any particular shape of pants may be shaped. As for instance: Riding pants require more fork, so that the rider can spread his legs sidewise. Sailor pants require more width at the bottom, and that width must be allowed on the outside, or else such pants would strike each other at every step. For all such and other changes we have a base to work from, and after all such changes are made we must see that provision is made to sew the parts correctly together, by carefully nicking the seams.

The center of gravitation in a pair of pants may be considered to exist at the points of the angles, which are eighty numbers below the top of the waist, hence a sweep from the point will make a true connection at any point of the leg, and such sweeps can be depended upon no matter how narrow the fore part, or how wide the back is cut, and especially so when laid out like Diagrams XIV and XV. Now, to make a draft from that point for every pants or pattern we cut, would be inconvenient, neither is it required that it should be done, except for practice; but when a cutter knows a center which is infallible, he is certainly better off than if he knows no such center. A sensible person, if he cannot do just as he wants too, will do the best he can; and, so in this case, there are several ways open for operations.

1st. Cut both the front and back of equal width at the knee, and notch there; then measure upward and downward.

2d. Run the inside and the outside lines of the angle of 10 deg. down as far as the cloth or the table allows, and sweep the inside seam from the inside line and the outside from the outside line, each seam separately, from a point as far down as you can reach.

3d. Fold the broader back over to the smaller front, so that both will lay smooth and without twisting, then cut the nicks.

4th. Square from each line of the angle of 10 deg., and at the knee only, because, at the knees, the front and the back are the nearest together, then measure up and down and cut the nicks, and in all cases be careful that the back is not held full behind the knee and upward on either seam.

If the distance between the smaller front and wider back were miles, or rods, even, the result would not be very satisfactory, but in this case the space is never more than 1 inch, and the variations in the several ways are not perceptible. The diagrams in this work are the best illustration of the sweeps from point 80, as well as of the cutting of all seams on a nice slope.

The medium sizes require the top of forepart about $\frac{1}{4}$ of the whole waist measure, but smaller sizes require the side seam further back and the larger ones more forward on account of the pockets. Another point should be observed: It has been stated that the center line of the angle of 10 deg. is a line to square from for a level bottom as well as for a level top, all of which is true, but the waist of the normal form runs downward in front, and the top of the normal waist should be run in the same direction, and for this reason should be squared from the front base line, and for extremely small waists it may be squared from the front line of the angle of 10 deg. Taking Dia. XIV as a model, we may sink the front of waist $\frac{1}{2}$ inch and raise the back $\frac{1}{2}$, to 1 inch from that top square line.

In conclusion of this article, I will say that, perhaps, I have gone too many times over the same ground, and perhaps I will go over it again and again, but it is always from a different standpoint and connected with something else.

GENERAL REMARKS ABOUT PANTS.

AT the present time, the style of pants is loose at the knee, tapering smaller toward the bottom. Pants which are cut wide at the knee must start with extra width at the seat line, and said extra width must be well divided on both seams. All pants must fit the same at the seat line and above, and fashionable width at the knee must be started from the seat line downward. Dia. XIX represents a pants of the present style, and is made over a pattern of 38 seat, actual waist measure 33, and waist made up 34½; about 19½ knee, 18 bottom, and is for a rather small waist. Dia. XX represents a large waist, of about 50 inches, made up; but actual waist measure 47, and seat measure 46 inches; knee 22½, bottom 20½.

For extremely large waists, Dia. XX may be used, and that extra width allowed equal in front and on the side. On all large waists, the seat measure must be taken close, and the fork cut accordingly, no matter what the hip and the waist measure may be. The seat measure is the standard for the scale, and the large waist must be fitted according to the measure, the same as the length of the legs, or the width of the knee. Dia. XXI represents a pants of 39 seat, with a very high waist. The top of waist is made up 37 inches, but at the hollow of the waist it is only 36 inches.

The angle of 7½ deg. has the proper width for all pants, at the seat line, and in no case is a reduction, or an addition required there. Above the seat line, the hip and waist must be made according to the measure, and below, it must be made according to style and measure. As to the top of the side, it may be proper to remark here, that if the top of the side is too small for any pants, the fork balance will be destroyed, because the sides of the body will draw the fork upward, and will cause it to cut the crotch somewhere. The waist is one continuous surface all around and may feel tight all around, but if the crotch is pulled up by a small waist at the top of side, that will saw the crotch on one spot. Therefore I will repeat the true balance for the waist, on the angle of 7½ deg. Reduce the angle of 7½ deg.—from 6¾ upward, 15 deg. for back slope—from the top of the center line of the angle of 10 deg. go forward ⅛ of whole waist circumference, close measure; cut a gore of 1 inch in the center of the back; measure from the front to the side and from the back to the side, and if that gives too much waist, cut another small gore between the forepart and the back. But if the waist requires more than that, divide the addition required into 3 parts, and place 2 parts at the sides and 1 part in front. If the waist is higher than ¼ whole seat measure, run the gore in the back, out to nothing on top, as in Dia. XXI, and the higher the waist is cut upward the more it must be cut like Dia. XIII, both at the side and at the front. Working pants with the front cut clear up to the neck, must have the upper part of the front cut like Dia. XIII, that is, sloped backward 15 deg. from the waist.

Dia. XX has 2 numbers thrown out in front and top of waist, and at line 8 it is 1⅞ while the double dress fork point has 1¼, which produces a good open cut for such pants. The point of the fork may be made ½ inch more or less for the same person, providing allowance or reduction at the point of the fork is run up and down, running out about 5 inches above the fork, and at, or below the knee. I know it is contended that a large-waisted form requires a larger fork in proportion to the seat measure, but this is not the case, as long as the hips and sides of waist have sufficient cloth. The thigh may grow in proportion to a larger seat, but it does not grow in proportion to a larger waist. Large-waisted persons have small seats in proportion to the normal form, and the proportion of the scale of the seat measure is large enough for all forms. That same result may be observed at the knee, and at the bottom; and to better express my ideas, I will say something about the diameter of the thigh, as well as the diameter of the knee and the ankle.

For the purpose of cutting pants, the leg may be considered a straight and round pole, but tapering at the lower end to about ½ of what it is on top. The thigh can be covered and fitted for modern pants, all seams included, if we allow it 4 times its diameter, close measure of the thigh, without compressing it. The circumference of a circle is equal to three and one thousand four hundred and sixteen ten thousandths (3.1416) times its diameter, which is so near to 3½ that we may call it so, at least for the purpose of cutting and fitting pants. Now, if 3½ diameters of the thigh will constitute the circle for the thigh, then that circle will fit the thigh skin tight, but if we allow 4 diameters, we have enough cloth to sew seams and a few inches besides for straddle and general looseness. If the diameter of the thigh were only 1 inch, 4 diameters, or 4 inches, would not give cloth enough to go all around, after 1 inch is used up for seams.

In cutting pants, we may say that a seat size of 36 inches is a medium size; and for the purpose of fitting such a thigh with a modern pants, we will call its actual diameter 6 inches, and its skin-tight circumference just 21 inches, and close investigation will show that this is a fair average. If we give such a pants 4 times 6 inches, and deduct 1 inch for all seams, we have 23 inches left to cover the thigh, which only measures 21 inches, and this would be plenty for the undress side. I do not say that a close-fitting undress side can not stand more than this, but I say it should have that much, and that 1 to 1½ inches more, evenly divided, will not make it too large for a fit, at least not for the present conception of a fit.

At the side of thigh, the angle of 7½ deg. is just ¼ of the whole *net* seat measure, which may be taken for a medium loose leg, but for a quite close fit, ⅛ to ¼ inch may be deducted, and for a quite loose fit, anything may be allowed there, which will make a nice slope for the seams. For a size 36 the angle of 2½ deg. has a width of 3 inches at the fork, and the double angle of 10 deg. requires double the amount of 4 times 3 inches, making in all 24 inches, to which is added 1¼ inches for the undress side, for extra straddle, and the bridge from one leg to the other, making it 13¼ inches in all for the half undress side.

The above calculation is here given for the purpose of showing how close the diameter and the circumference of the thigh correspond to the angle of 7½ deg. as used in this work. It also shows that a larger thigh, say of 7 inches diameter, produces more cloth in proportion to a smaller thigh of say 5 inches diameter, and that the addition of 2½ inches to each and all half seat measures will give a good balance for all sizes. But for reasons explained elsewhere, boys should have plenty fork, and when we come below size 28, we should give all that is consistent with a very open cut of the fork. The largest sizes may be cut according to the scale and to Dia. XX.

At the knee the same proportion of 4 diameters will hold good. Let us accept the diameter of the knee of a seat size of 36 as 4½ in., and allowing 4 times 4½ in., we have 18 in., from which is to be taken off 1 in. for seams, and we have 17 in. left, which is enough to cover the leg. But we find that for a 30 size the knee would not be large enough for the purpose, and an addition must be made according to the measure, and the contrary is the case on larger sizes, as shown in Dia. XX.

At the bottoms we find the same calculation to be true, for if we take the diameter of the ankle to be 3 in. for size 36, the 4 times 3 in. will give us 12 in., and after 1 in. is used up for seams, we have about the actual circumference of the bare ankle, and whatever boot, style or notion requires more, is allowed equally on both sides, except on sailor pants, which must have more on the outside, and the inside must have a reasonable allowance only.

Dia. XIX is made from a pattern of 38 seat size, and 33 actual waist measure, but the waist made up will be 34½ to 35 in., and which may be called a normal waist. The back seam must be cut on a gentle curve on and over the seat lines, because the curved edge over the seat seam will become straight while winding around the seat. That portion of the side seam between the calf and the seat line, must be regulated according to the measure of the knee. Whenever the style requires a large knee, the side of the thigh must have more width, starting at the seat line and running down to below the knee, so that it can spread in such a manner that both front and back will possess a smooth even slope. Extra width there will not show, but will hang there as though the body would fill it out. When a person assumes a sitting posture the width from the outside will go backward just as easily as the width from the inseam will go backward, and the extra width will not interfere with the side of the thigh; but extra width at the back curve, at line 8, will do harm,—in fact it will interfere with the seat, unless it can be spread also.

To be successful in cutting pants, a cutter must be able to produce a close-fitting one, and when he can do that he must be able to use the close-fitting pants as a base for a loose-fitting one without losing the balance. After

a cutter can do this he is not yet done, for then comes those tasty touches, which consist in his ability to harmonize thigh and knee and bottom for each particular customer, and which cannot be learned from the books, but must gradually come to him through experience and attention to business.

A narrow leg must be shaped according to the shape of the knee, and should be held a trifle full over the knee, say about 4 in. above and 4 in. below the center; but that "fulling" must be equal on both sides and carefully notched, so that the maker cannot throw the leg out of shape. The best way to notch the seams is to notch equally about 5 in. above and the same distance below the knee, and then measure down equally to within 5 or 6 in. of the bottom, and notch again. Within these 5 or 6 in. above the bottom all stretching of the side of the fore part must be done for spring-bottom pants. These may seem quite too many trifles to attend to, but a few notches are soon made, and if a leg twists it will perhaps take hours to alter it,—often it will become worse in altering. A small leg should also have a trifle curve or spread at the outside seam, over the side of the calf, while the inside is perfectly straight, except what is required for the shoe or boot or style, and a close-fitting pants must also be stretched at the back crease line over the calf. Cutters, and tailors as well, must study the form of the body from neck to ankle, and their ideas must harmonize as to what that form requires.

A line may be struck anywhere on a pattern and used as a base to work from. A line may be struck from the top of the side to the inside ankle, and the same thing can be produced on a larger or smaller scale. But such a line is only an imaginary base. A line to be worthy of the name "Base" must correspond to certain angles, or certain edges or slopes of the body, and for this reason I claim that the angles of 7½ or 15 deg. are perfect bases for cutting pants, because they correspond to the slope of the sides of the legs. Now, when we receive a new work, or a new diagram, or a new pattern, from our latest fashion reports, we find a line here on one, and a line there on the other, which they use as bases, and both may be right; but unless they show distinctly why it is a certain distance from one point to another, and why the lines are just so and not otherwise, all parts and points must remain uncertain quantities with the uninitiated when the pants is to be made either larger or smaller at the waist or at the knee.

In using the angle of 7½ or 10 deg. for cutting pants, the base is clearly indicated, and either line of its different divisions may be used as a base. As a proof that the angle of 7½ deg. is a true base for all pants, is the fact, that after the pants pattern is marked out, as in Dia. XIX, XX and XXI, and the sweeps for notches are made from the point of the angles, the point of the angle may be used as a pivot, and the forepart may be thrown forward so that more back slope will be observed, or the forepart may be thrown sidewise so that less or no back slope may be the result; and in both cases all points will change their relation, except the sweeps from the point. What one side loses the other side gains. If all other points are correctly balanced it matters not how large or how small the back slope or the fork of the pants may be made, or where the seams are located. (See Dia. XXII and XXIII.)

If a cutter goes to the trouble to mark a line for every degree or fraction thereof, and draw stitches in them, he will find that the legs will fold, or can be pressed into shape, on any of these lines, and on no other. When such a pants leg is sewed together, it may be turned in almost any position, with or without back slope, and will always turn from the point of the angle, though cut off at the ankles; and the sweeps at the knee, or at other points, swept from the point of the angle, will always fit together. And when the garment is upon the body, such sweeps will be horizontal lines all around the form, and no horizontal line can be produced from any other point, either by square or by sweeps.

The above reasoning ought to settle the question of back slope, which has been the great conundrum for the last century. I have gone through a great many tribulations in cutting pants, and other garments, and it may be that I have killed more garments than anyone else, but I determined to solve the question if life permitted, and I claim that I have been rewarded. Looking back over a forty-year struggle, I feel that kind Providence has treated me very kindly, though in disguise, by refusing to let me succeed years ago; for in that case, I suppose, I would never have thought of trying to discover anything better.

I will here mention one difficulty I have had to contend with, and I have no doubt but that others have experienced the same trouble, and that a great many more will have the same vexation after this, unless they understand the principle of their work. Sometimes my pants turned out to be too long, and at other times too short; and no matter how long or how short I took the measures they would turn out to be just the opposite. Without going into details, I will give the reasons for such defects as I have learned to understand them.

Pants may be too long or too short without any other fault; and such must simply be made shorter or longer. No cutter need expect to be exempt from the necessity of such alteration, and such alteration I do not speak of as meaning faulty pants. I speak of too long or too short pants which are too long or too short because the misconstructed leg twists somewhere, and produces folds or wrinkles, and consequently draws the bottom up or down. Pants may be too long because the fork is not large enough from some cause, and cannot be drawn up into the crotch, and must be let down and cut off below; but such a garment will draw up at every step, and when the wearer assumes the sitting position the bottom will crawl half way to the knee.

Pants which have too much cloth in the front of the waist will be pulled backward under the buckle-straps, and in so doing the whole back will wrinkle and work downward, and will crawl under the heel at every step, unless made quite short; while walking, each step will draw a wrinkle from the bottom of the inner seam forward and upward to the knee. Many a garment of this kind we see every day upon the streets of every city and town.

Now comes the opposite. Pants which have too much back slope form extra large seats, and consequently they can be drawn as tightly as possible without cutting the wearer. Such must be cut extremely long at the bottom, and it will be found that it is not much of a trick to cut two pairs of pants for the same person of which one is to be an inch longer than the other. Pants that are cut away too much in front and back, and spread sidewise, will also become too short at the bottom, because in bringing the side to the body the whole front and inner seam are laid in wrinkles, which take up length. Such may be made long enough by opening the side seam and giving the whole side seam at the thigh a good stretching, extending backward and forward as far as possible.

Another cause for shortness of pants at the bottom is when the fork is not cut deep enough, for if the point of the fork is too high for the front and back curve, the extra height will fold up, and, of course, being within the measure, will be missing below. In this connection it is perhaps the proper place to point out the way in which to treat the crotch, as regards the depth of the fork point. From the front base line of the angle of 7½ deg., mark at 6¾ for the seat line, and square to the side; mark lines 8 and 10, make the division of the angle of 7½ deg. on line 8 as 3 and 9 sidewise and 3 forward; then square from the inside line of the angle of 10 deg. through 10 in front of the thigh. And observe, that squaring through point 10 from the front line of the angle of 10 deg., as directed in this work, will locate the fork point ½ inch lower than if the squaring was done from the center of the angle of 10 deg. through point 10.

If the back is made 4¾ wide, the point of the back must sink about ¼ inch lower than that square line through point 10, but a sweep from point 80 would bring all points on the same sweep. At the angle of 10 deg., the undress fork is about ⅛ to ¼ higher than the sweep or the square line, while the dress fork and back are about ⅜ above the sweep. All of which must be observed in shaping the crotch.

The width of the knee should in all cases be measured, but in the absence of a positive measurement, it should be observed that the half-seat measure gives a good width for the knee for size 36, but size 48 is large enough with 22 in., or 2 in. less than half seat, while size 24 requires a knee of at least 14 in., or 2 in. more than half seat, and it should be easy for every cutter to grade the sizes between. The same variations must be made at the bottoms.

The points of the fork must be considered unchangeable, except for style, and all changes, as to the backward or forward leaning waists, must be made upward. The fact is, that the fork and the seat are the only parts of the pants which can be obtained satisfactorily by the scale; all other widths and all lengths must be obtained by the measure.

By observing Dia. XV it will be seen that a certain hole is cut out of a certain sheet which the body is expected to fill out, and whenever the front is made larger it must be made that much smaller in the back, and *vice versa*. On top of waist, the body shifts backward and forward, and the pants must follow, while both body and pants must be considered stationary at the fork. Dia. XV was intended to represent a large waist, and also a forward-leaning waist, hence the front of the body is in front of the base, showing that the front of the pants requires additional cloth. The position of Fig. and Dia. XV must be considered as a person split in two from back to front, and a sheet of paper applied as shown by the diagram.

One of the most common faults of otherwise well-fitting pants is a fold or a crease forming at the bottom of the in-seam, and running forward and upward to the centre of the leg in front anywhere below the knee. It may be observed when a person stands still, or when he walks, but it becomes worse when walking; the kink forms at every step. This monstrosity can even be seen on the fashion plates, the publisher of which may contend that this is a natural fault, or that it is so because of a person's peculiar position, or the way he walks, all of which is

bosh, because a good-fitting pants does not do that, and a customer who leaves his order does not expect such fits, and he would not leave his order for any price, if he were assured in advance that his pants would cut such snouts when done.

The fact that a great many pants cut such sorrowful faces when on the street is no excuse for any cutter to follow suit. Pants can be cut to hang straight, for we see them right along on the street, and we may see a nice looking pants to-morrow on a person who wore a gimlet yesterday. Pants with the above named faults usually set straight if the wearer spreads his legs, say about two feet at the ankles, which shows that such pants would fit on a person who should walk in that position. If the upper body fits, the change must be made from the crotch down, by starting there and giving more width at the bottom of the in-seam, and taking it off at the outside, which gives the leg a different slope, the amount of which must depend upon the judgment of the cutter, but I will say that one inch goes a great ways.

If a cutter is troubled with this fault, the best thing he can do is to pin up the fold on and along the in-seam, and anywhere below the crotch, until the leg hangs straight, then fold the pattern the same way and change the draft accordingly. The same effect can be obtained by cutting the pattern through at the outside. But to imitate this cutting through on a pants which is made already, the side-seam should be opened and both sides, back and front, pretty well stretched at and below the side of thigh. Stretching both outsides as far over as possible is equal to shrinking both insides. Shrinking the inside would come back again, and make the pants too short, but if the outside is well stretched, that will remain.

This fault may also be altered by opening the whole in-seam and by dropping all the nicks of the forepart $\frac{1}{4}$ to $\frac{3}{8}$ inches below those of the back, and cutting top of back fork that much lower. Changing the sides in a contrary way will accomplish the same thing. Dropping the forepart in-seam $\frac{1}{4}$ inch below the back in-seam nick will throw the center of foot at least 1 in. sidewise. My experience with such pants is this: Rip the whole pants, every seam of it, cut a new pattern and stretch or shrink all parts of the pants, until they conform to the pattern. It is better to lose the making of the pants than to alter blindly and spoil the whole of it. Pants which have faults contrary to the above description must be altered contrary to the above alteration, all of which must be done by a mechanic who knows his business, and one who feels an interest in the work to be done. It takes a good tailor to be a good bushelman.

The normal form requires the height above the crotch $\frac{1}{4}$ of the whole net seat measure, that is about 9 in. for a seat of 36, which is long enough for the body, and for a pants that is intended to fit close at the waist. But a great many persons require their pants higher up, and 10 or more numbers of the scale may be used. Pants which are cut higher than $\frac{1}{4}$ net waist measure must be sprung out on top, and on both the side seam and on the gore, as shown in Dia. XII, and such pants should be as large as possible at the top, because a pants must not strike the short ribs at the side. But for such high pants the buckle-straps should be entirely omitted, or placed low, so as to draw at the actual hollow of the waist. If it were not for the pockets, waist bands would be useless, and no pants require waist bands over the back. If waist bands are cut over the back, they should be sewed on loose over the back, especially on high waists. A great many hold the backs full on the waist band, but this is not good, for if the waist is to be smaller, the gore in the back may be cut larger. Sewing on the waist band tight, is just as bad as sewing the collar of a coat tight over the side of the neck. Where the waist band is to be, or at least where it ought to be, the body turns larger upward and the waist band should be loose, unless the waist is quite short.

Hip pockets are an abomination, but somehow, men want and tailors must make them; but all such pants should be cut high in the waist in order to bring such pockets high up, and for this reason the buckle strap should be omitted, or they may be sewed on the outside of the hip pockets, so that the pocket is above the strap, and the sides should be cut as in Dia. XII and XXI.

Some cutters require that the pants maker hold the back full on the top of the in-seam, and others again I have seen who require the fore part stretched, and others stretch both back and front crotch, while again others have a stay put in the whole length of the crotch seam to keep it from stretching, and all may be right providing the pants are cut accordingly.

As far as this work is concerned I have adopted the middle way, and say that the seams should be sewed up even. But here I must caution any one not to stretch the in-seam unless he has a good reason to do so. The in-seam stretches so much easier than the outside seam, and if stretched, without it is required, throws the pants

legs into a different direction; that is, too far apart at the bottom, and such pants will only fit when the person spreads his legs apart, say 10 or 12 in., or if he stands on one leg only. Such pants usually throw a fold from the instep, up and forward, to the knee at every step, and there are plenty such pants seen all over the country.

The ready-made clothing manufacturers are always up to the times, and catch on to such things, and to-day we see a great many ready-made pants with a stay tape in the in-seam.

Some of these days pants will again be made with welted side seam, which double stitching will make the outside stiff and draw that seam together, while the in-seam stretches, and the above fault will show still worse. This is one of the points which should be studied carefully by every cutter and tailor, but which is not considered by a great many, hence by observing the "hang" of pants on persons on any street in any city, we find only a few perfect hanging pants, while the great majority flap in all directions. There are certainly more mis-fitting pants to be observed than any other garment. I consider the cause of it in the greater length of the parts of pants, and also in the fact that they are sewed up all around. A frock coat has a chance to go backward or forward by an open front and open back skirt, without showing wrinkles, but pants are sewed up all around, and the least misconstruction will show. But there is another reason. The waist and skirt of a coat is all outside of the body, while the pants may be said to have a partition in the shape of a crotch seam, and which crotch seam is affected by every step. I do not like the idea of putting a stay tape in the crotch seams, because all such seams should be made up thin and neat, and again, pants makers may go to the other extreme and draw the stay too close.

If pants seem to have the above described faults, I would advise cutters to give the inside of the bottom $\frac{3}{8}$ more on the double, that is, locating the center of heel and foot $\frac{3}{8}$ more toward the inside without disturbing the angle of 10 deg. This taking off at the outside and putting it on the inside must start at the thigh, and amounts to about $\frac{1}{2}$ at the knee, than what it is at the bottom.

In cutting and making pants, or any other garment, a cutter must know whom he is trying to fit, and for what occupation the garment is to be used. It wants to be considered as to whether the person mostly stands or sits. A person who wants a suit for a wedding requires a different thing entirely than a person who hitches up horses or who works in the field, or digs in a trench. A tailor requires a larger pants waist than a clerk, and any tailor who ignores this fact is mostly found squatting down with the top button of his pants open. Now, if a person who writes all day wants to sit down comfortable when he works he must have a pants which is loose, and even too loose when he stands or walks, but that can not be helped, and a customer should be so told when he orders his pants, and he can have his choice. But it must be observed that persons who sit a good deal and want a loose waist require the allowance in front and side and the back slope should be made liberally large, in order to obtain a longer seat, even if the seat shows surplus cloth when standing. A long back slope prevents the pants from pulling up from the bottom, when sitting down, and we find that pants which fit very neat at the seat when standing, are more apt to crawl up when the person sits down, than such pants which show surplus length of seat when standing. But right here let me warn of an error into which many cutters fall:

A pants cut on certain lines or angles, like Dia. XIX, XX and XXI, requires a certain amount for fork and a certain amount for back slope, or length for the seat. Each has a certain function to perform. Not enough fork, and too much back slope, will allow a man to wear such a pants, but the seat will wrinkle too much. Contrary, too much fork may be drawn backward to supply a short seat, but such a pants will never hang or feel comfortable, unless the surplus, whatever or wherever it is, is thrown to where it is wanted by stretching certain parts, as described elsewhere. The same may be said about allowing cloth for a large waist, which requires a certain part to be allowed in front and a certain part at the top of side. Surplus cloth on the top of side, which ought to be in front, will be thrown forward, and form a fold, starting at the side of thigh, running forward, and when a person sits down, he will have his whole lap full of cloth.

Such are points which nobody will ever be able to teach to a certainty, or to learn from the books. All that can be done by a teacher is to point out causes and effects and approximate amounts for alteration; and a cutter must use his brains to pass judgment as to the amount taken off here, and given there, in each individual case, and that the ever varying forms of men will require an ever watchful cutter to fit it with such garments as a changeable fashion from time to time requires. Learning rules or going to cutting schools and hanging up a diploma near the cutting board don't make successful cutters. After receiving certain instructions, a cutter must get the "*right hang*" of it by experience, and if he is a "*natural born*" cutter, he can use a horse shoe or a boot jack for his rule, and he will succeed as easily as a fish learns to swim, but if he is not a natural born cutter, or it may be better said, a natural born Fitter, he must acquire the "*Art*" by hard study.

STRIPES.

IF Pants are cut from striped goods, the stripe should run parallel with the center line of the angle of 10 deg., both in front and back, though on the forepart it may be located an inch sidewise on the top of the waist; but the back part must have its stripe on that line. This is important to bear in mind, particularly on large pants, which are to be seen often with the stripe running inward or outward. On plain goods it makes no difference where the seams are cut, but on striped goods the forepart should be cut narrow at the side of the thigh, and broad at the side of the bottom in order to run the stripe parallel with the side seam.

It is quite an accomplishment to be able to determine the location of the seams on all kinds of pants without causing them to lose their balance. The top of the front may be cut $\frac{1}{4}$ full waist for the middle sizes, but the smaller sizes must be cut large enough to make room for the button-hole fly and the pockets. On large-waisted pants, it may save a good deal of piecing to cut the top of the forepart broad, and even as wide as the angle of $7\frac{1}{2}$ deg., and then cut the pockets forward independent of the side seam; but if the material is striped, the stripe will be too crooked over the center of the front. On the front, the stripe may run 1 in. to the side of the top of the center line on all pants, but on large waists, it may run 2 in. sidewise on top. On the back the stripe must run with the center line.

On a vest the stripes should run at right angles with the pockets, and nearly parallel with the front edge. On all cut-a-way coats, run the stripe with the front plumb line. On the back, run it with the edge of the back tack, and with the edge of the side of the back skirt as well as with the edge of the front skirt, so that the stripes fit to the pleat; but on straight coats, the stripes should run parallel with the front edge, even if the back edge is a trifle bias.

On the side-piece, the stripe should run nearly with the back when they are sewed together, and at the same time the stripe of the side-piece and skirt below should run nearly in the same direction, or as near as possible. On the sleeve, the stripe should run with the front sleeve base.

COAT AND VEST BASES

AND THE

ANGLE OF 135 DEGREES.

SCALE: One-half breast and 2½ in., divided into 20 parts. The common inch produces breast size 35. Bases: See Fig. I and II and Dia. XI and XII. Fig. I shows the angle of 135 deg. to be applied in measuring the shoulder slope. The angle of 135 deg. is the base. The cutter is to find the variation, which is seldom over ⅜ inch higher or lower, but the angle of 135 deg. will fit 49 in every 50 cases. Fig. I shows the angle of 135 deg. over the back as well as over the front. In this position the two angles of 135 deg. cover two backs and two fronts.

The center of the back and center of the front represent the center of each angle of 135 deg., as the center of back and front, a hole being cut for the neck to pass through. Dividing the angle of 135 deg. in the center of the back or center of the front leaves half an angle of 135 deg. on each side of the back and each side of the front. The two halves again united will form another full angle of 135 deg. placed on the body, as shown on Fig. II with the front line running forward 15 deg. of the plumb line, and after a hole is cut for the neck the back line can fall down to the center of the back, closing into the top of the shoulder, for the shoulder slope is within the angle of 135 deg.

Taking away 15 deg. in front of the plumb line leaves 120 deg., or 2 points of the circle, as shown in Dia. XI and XII, each containing 60 deg. The center of the 120 deg. and the center of 135 deg. represent a space at the top of the shoulders, which may be used for the shoulder straps on military or society coats. The shoulder seam is cut through according to style or notion, and the forepart and side connected under the arm with the center of the back and the center of the front running parallel, as in Dia. I; or the back running parallel with the plumb line, as in Dia. II.

Either the front or back line may be used as a base, as in Dia. I, or the back line and plumb line, as in Dia. II. With the help of the diagrams, the bases ought to be plain to everyone. Yet the following in addition might be said: The angle of 135 deg. is ⅜ of a circle; cut on the double, it will give ¾ of a circle when spread apart. Three-fourths of a circle represents 3 squares, and a vest or coat, or any garment worn around the neck and shoulders, consists of a ¾ circle, or of 1 circle less 1 square. (See Dia. XI and XII.)

When the square is cut away from the center of the circle, and a hole cut in the center large enough for the neck to pass through, and the front edges are again connected, then it will fit the whole outside of the human form, except the sides below the arm. The square cut out of the circle takes away all shoulder slope. Each of the two backs and fronts requires a reduction of 22½ deg., as shown in Fig. I; hence, 4 times 22½ deg. will take up the full amount for both shoulders. If each back and each front requires a reduction of 22½ deg., it will require 45 deg. or half a square to be cut out on each side of the body, as in Dia. IV and V. Thus the bases are:

1st. The full circle.

2d. Three-fourths of a circle.

3d. Three-eighths of a circle, or 135 deg., for the center of the back and front.

The angle of 135 deg. is again divided into 4 main parts, as 90, 45, 30 and 15 deg., and may be divided into as many minor divisions as fancy will admit, or points to be found in the variation of garments, as in Dia. XII-A.

To measure the shoulder slope as shown in Fig. I, is a thousand times better, and more reliable, than the so-called upper and lower shoulder measures, or whatever such measures may be called. But for all that, actual practice in taking this measure will show, that even here some guess work must be done, and while I have said elsewhere that the shoulder slope should be measured, and that it can be measured, as indicated in Fig. I, yet it is equally true that that measure can be learned to be taken by sight, and such eye-sight measure may be acquired in one week, or after handling and measuring one dozen persons. After the eye of a cutter has caught the normal form of the shoulders, his eyesight will teach him most all variations, as good as a measure. That measure, taken by eyesight, or with any other instrument, must be taken over a coat with a good-fitting shoulder, or better, over a good-setting shoulder: for a shoulder may fit the body and still may not set well.

Again I must repeat this warning: Be slow in making changes, especially at the shoulder seam, for Dia. II will fit 49 out of every 50 persons, providing the sleeve does not drag the shoulder out of place.

The single garment, spread upon a flat surface, represents a circle, less one square, or less 90 deg., or a reduction of 45 deg. at each shoulder; but it must not be supposed that the form of Dia. XI, after having the edges of the square connected again, will form a slope like the shoulders of a human form, that is a slope of $22\frac{1}{2}$ deg. The shoulder slope is calculated at $22\frac{1}{2}$ deg., but that is only on each side of the body, and the center of the front, and the center of the back run down more straight, and in order to bring the $\frac{3}{4}$ of a circle, like Dia. XI, in harmony with the shoulders, the centers of back and front must be pushed nearly straight down, and then the sides will rise up, and form the slope for the shoulders.

If Dia. XI is cut from a piece of stiff paper, and the edges of the square are connected, and that circle formed in one continuous shape, like that of a lamp shade, it will form a slope of 30 deg., or near that slope, and corresponds to all diagrams, with a square of $17\frac{1}{2}$, and with the plumb line base in front, from which base the shoulder slope is 30 deg., as shown in Dia. IX.

Here it will be noticed that the bases, as adopted in this work, mean something more than imaginary lines. They mean actual slopes of the human form, and quantities which are parts of the square or compass, and which instruments are known and used by all civilized nations.

SQUARES OF

SEVENTEEN AND A HALF AND TWENTY.

THE squares of 17½ and 20, and lines 9 and 11¼, are both permanent bases. But the lines which connect the back to the foreparts, or to the side piece, or join lines 9 and 11¼ over the front, require especial explanation. Line 9 on the front base of the angle of 135 deg., and line 11¼ on the front plumbline, meet in the center of the square of 20 and in the position as indicated on Dia. II. Line 9 is broken between the side-piece and back, and turned 15 deg. upward, but will be of the same space as the square of 20 when the side-piece and back is connected. The square of 17½ is one-eighth less than the square of 20, and harmonizes with the division of the circle, as shown on Dia. XII.

In both Dia. XI and XII, the circle has a full diameter of 40 numbers, and the triangle as shown in Dia. XII, has 35 numbers on each line, making an equi-lateral triangle. One-half of the circle is used as a square of 20, as in Dia. XI. One-half of the triangle is used as a square of 17½ as in Dia. XII. The square of 20 represents the amount used for the whole halt vest, seam and surplus included, and the square of 17½ represents the half breast measure. The correct combination of the square of 20 and 17½, can only be used on a vest with one seam in the center of the back, and one seam under the arm. On coats the square is enlarged on account of more seams and other reasons elsewhere explained; but for all that, the squares of 20 and 17½ are a true guide for all coats. It will be seen that the squares of 20 and 17½, as used in this book, are not imaginary lines, but based upon a scientific calculation from the center of a circle or the corner of a square, which are used by the whole civilized world as points, or fixed facts.

By further examination of Dia. XI and XII, it will be found that all the essential points necessary in cutting a vest can be found within a circle, and without using a scale—all of which is further explained in the article entitled, "Scientific Calculation." Another reason why lines 9 and 11¼ on the front bases are adopted, is the following: Lines 9 and 11¼ meet in the center of the square of 20. Line 9 runs at right angles with the center of the front. Line 14 on the back runs at right angles with the center of back. When the garment is upon the body, both run in the same direction, are in their natural positions, and on a square of 20.

For the reason that the vest is cut off below the waist, it can be cut on the square of 20 without piecing the pattern. But on a coat this cannot be done without piecing the pattern, and in order to obtain a draft or a pattern, without lap or piecing, the square of 20 is transformed into an angle of 15 deg., which contains the square of 17½ as for a vest, to which is added one-half for one extra seam, and which one-half more causes the squares of a frock coat to be 18 and 20½. And for reasons explained further on in this article, and in Dia. III, a three-seamed sack must have the same squares as that of a frock coat of five seams.

The following points must be well observed: Dia. II has a square of 18, or half an inch extra on the plumb line base, which half an inch is allowed for one extra seam. The square of 17½ would answer the same purpose if each side piece and each forepart was allowed one extra seam; but this would cause the pattern to be pieced, or allowance would have to be made for one seam, which will always be found troublesome, and for this reason the square is enlarged to 18. But, to be more definite, the square should be 17½ and half an inch for all sizes, because if ½ an inch is allowed for a seam, this seam requires the same for all sizes. Perhaps ⅝ inch will do the

same, or maybe better for a snug fit, particularly for fine work, where $\frac{3}{8}$ of an inch is amply sufficient for a seam; but I call it $\frac{1}{2}$ an inch for the reason that $\frac{1}{4}$ of an inch more or less in an entire coat is nothing, particularly when we must admit that no two cutters will take the same measure, and that very few cutters are able to take the same breast measure twice with the same result, if done so in using a blank tape.

Though the square of 18 will result in a square of $20\frac{1}{2}$, we find that if we observe Dia. II correctly, the back square, which ends at point 15, on the center of back, sinks below line $11\frac{1}{4}$ in front, and becomes larger and consequently a reduction is made at that line between the back and side piece, in order to re-establish the square of 20. Again, if we observe Dia. III, or the combination of frock and sack (and the vest as well,) we find that by turning the sidepiece forward at the waist it will turn backward about $\frac{1}{2}$ inch at the shoulder blade, and although the top of the sidepiece and back lap $\frac{1}{2}$, the square remains 18 for a three-seamed sack coat, the same as for a frock. The fact that I did not observe this simple point at the beginning, but made the square of a three-seamed sack $\frac{1}{2}$ less than a frock coat, caused me to devote years in making alterations.

Dia. III is the best combination of frock, sack and vest, which I have been able to secure in 10 years of diligent study. Though the vest is not shown on it, because too many lines spoil the illustration, but anybody may observe the sameness in Dia. XII. Now, supposing the vest to be put in Dia. III, we simply reduce its square $\frac{1}{2}$ under the arm to make it $17\frac{1}{2}$ and place the height of back at 14. The combination places the different backs at the following height above line 9. Frocks at $14\frac{1}{4}$, vests at 14, and sacks at $13\frac{1}{2}$. The squares of 18 and $20\frac{1}{2}$ are, of course, for a coat, but this does not destroy the principle of cutting a vest over the same pattern, simply reducing it $\frac{1}{2}$ inch in width under the arm, and cutting the top of the back $\frac{1}{2}$ lower, or $3\frac{3}{4}$, as shown in the Vest Dia.

Neither the square of 20 nor the square of $17\frac{1}{2}$, nor the angle of 15 deg., nor any other angle or square, will fit the body precisely, either of which must be adjusted to the requirements of the form; but when we know what a certain square or angle represents, and how they harmonize with the slopes of the body, we can very easily deduct or add to, as the case may require.

Now, although certain garments require more or less in the square, I will, in comparing, always mention the squares of $17\frac{1}{2}$ and 20 as on a vest, for the reason that line $11\frac{1}{4}$ meets line 9 at its center—that is, at the center of the square of 20—from which point all calculations are made for turning or changing the lines over the back. The square of $17\frac{1}{2}$, with the angle of 15 deg. attached in front, produces both squares $17\frac{1}{2}$ and 20 on this particular spot, though the square of 20 is broken on line 9; and within the squares of $17\frac{1}{2}$ and 20 all calculations are made in the article on "Narrow and Broad Backs." By the terms: square of $17\frac{1}{2}$, or 18, or 20, etc., I mean to say that the distance from the centre of the back to a certain base in front is such a distance. It may be that if I should say: a right angle, so and so far from back to front, would be better grammar, but I think, a square of so and so much will be fully as well, and may be better understood by the majority of cutters and tailors.

DIAMETER OF BOTH SHOULDERS FROM SIDE TO SIDE.

THIS article was written as long as ten years ago, and I have often thought to omit it, but have come to the conclusion that it is worthy of a place, and in fact, I may build better than I expect. Dia. V, VI, IX, and all others with a square of 17½ represent the diameter of the shoulders from side to side, either on the half, as Dia. V and VI, or the full, as in Dia. IX and others. Fig. I represents the full diameter, but cut in two at the center of the body. The width of the shoulders may be measured, but ordinarily that measure may depend more upon the condition of the garment over which it is to be taken, than upon the body itself. As a rule, that measure should be taken only for extremely narrow or extremely broad shoulders, and even then, there must be a good deal of guess work. As long as we allow the width of the shoulders 9¼ at 60 deg. we will never miss the mark from size 35 down to the smaller sizes. When we come to size 40 we have enough with 9 to 9⅛. Forty-three is plenty wide with scant 9, and size 50 is large enough with 8⅞. Here is a difference of ½ number on each side of the coat, in 25 sizes, and that calculation can be depended upon. The width of the shoulders does not grow in proportion to the circumference of the breast, and in cases of doubt as to how much to allow at 60 deg., it is better to allow ⅛ inch too little than ¼ inch too much. A shoulder which hangs too far over to the arm, and which is often noticed on large sizes, is worse than a shoulder which is too narrow. Again, a broad shoulder requires a scant sleeve head, while a narrow shoulder can stand more fullness on the sleeve head.

But I have started out to describe the shoulder of a man, as they may be narrow or broad, and in order to be quite plain, I will take up size 35, and use the term inches, for this particular article. On a draft of a size 35 the width of one shoulder, from back to side, is about 8 in., and which is ⅞ inches less than the half square of 17½, but the ⅞ inches are used up for seams. On top of the shoulders, the body is nearly flat, both across the back and front, and it is quite flat on a great many persons, but for our purpose all may be called entirely flat, and that part can be measured with a straight edge when the coat is on the body.

On this part, and above, the coat must swing the same as a piece of cloth will swing on a straight pole. If that part of a coat fits nicely, a great many other faults are usually forgiven, but if the shoulder breaks somewhere, complaint will be made. It will be seen by this, that the square of 17½ is not an imaginary quantity, but that it is in actual harmony with the shoulders, the same as the angle of 15 deg. is in harmony with the forward slope of the center of front. There is the square for a regular part of the form, and the angle of 15 deg. is for a irregular part.

On the lines of the square of 17½ a coat or vest can be folded up flat, and this can best be seen on a vest, which has no sleeves to hinder it from folding flat. A good-fitting vest can be folded up, on the square of 17½, and laid on a flat table, and it may lie there for ages without wrinkling, but can not be so folded on any other square. The angle of 15 deg., or the front part will always run forward of the center of the back, when folded up. When a garment is put on the body, it has to perform two distinct motions, and the center of the back must be considered the hinge on which the coat swings, just as a door swings on its hinges. From the center of the back the garment is swung sidewise, and locates from back to side, not from back to front, and for this reason must be fitted on straight lines in the back and in the front. From the side of the back, the garment is swung forward to the side of front, and both side of back and side of front may be called hinges again, because the body is really flat between all these points, and from the side of front the garment is swung again to the center of the

front, where it runs up and down parallel with the center of the back. While it makes this motion it loses nothing in length, but its whole width of 20 in. will be divided between the two half diameters of the shoulders sidewise, and between the diameter from back to front.

The upper part, or that portion of a garment which is located on top of the shoulders, must perform a different motion. While the lower part swings around the body in a circle, the upper parts move on straight lines, on which the whole back is swung forward and the whole front is swung backward until they both meet. The shoulders lose in length, but nothing in width, which remains the same on the body as it was on the flat table. A garment must swing, and balance itself on the diameter of the shoulders, and there a coat must fit the body, and perhaps this is the only place where a garment should actually fit, as far as the conception of an actual fit goes, in garment fitting.

But now, we must consider a broad and a narrow shoulder, and observe the results of putting the same coat on both forms: The center of the back can not give, and the cloth must be thrown over the shoulders forward, and in a circle; and if anything is in the way which takes up more cloth, like a broader shoulder, which throws it sidewise, the front will be the loser, that is, the front will be too small. Here may be found one of the reasons why some men require a larger coat in proportion to their breast measure than others. The broader shoulder requires a larger coat around the sides and armhole than the narrow shoulder, because the broad shoulder throws more cloth in that direction, but the measure around the solid chest indicates nothing of that kind.

Let us suppose we have before us a man to be measured for a coat, and when we observe him, we make up our minds that he measures 40 inches breast. We draw the tape and it records 38. We measure again with the same result. Next we take the proof measures, and we take the so-called upper and lower shoulder measure, short measures, long measures, and what not measures, then we add and subtract again, according to our learning, and then we cut the coat very carefully, so that every fraction of the proof measures conform to our lines; and when the coat is done and the customer puts it on, behold! it is too small all over, the coat is thrown onto the shelf, and afterward sold for half price, notwithstanding that it was cut promptly to the balance measures. On a narrow shoulder we observe the contrary results as to the fit, and we will always find that a narrow-shouldered person can wear a smaller coat around the arms and the back.

In regard to a narrow shoulder, we may consider the form of an erect and full-breasted male and that of a female. As far as the upper part of the body is concerned, they must both be treated on the same principle. According to their breast measures, both need a smaller coat around the arms and back and a larger portion must be allowed in front of the breast. Strip a female's breasts, and she will measure several inches less, and that amount has to be taken off in front, and that form will correspond to the form of an average male form. Now, to fit a female with a coat draft for a male, we must use a 34 pattern for a 36 breast, and allow 1 in. over the front of each half garment, and reduce, by gores, whatever the waist is smaller in front and below the fullest part of the breast. A coat for a full-breasted male must be treated on the same principle, only less prominent.

I do not claim to know much about cutting and fitting garments for females. That takes quite another calculation, but if I would start in to-day to learn to fit garments for females I would start out by taking a draft for a man's coat for my guide, and use a scale of 2 to 3 sizes less for the female; allow 1 to 1½ in. at the front of each half breast and reduce at least 1½ in. at the waist below each breast. I would not change the shoulders, nor the hollow of the back, except the location of the seams, but I would go to work and find the normal proportion between the waist and the hips of a female, and thus produce spring enough over the hips, which nature has wisely provided very large for females. The center of back and front I would cut nearly on the same plan as Dia. II, only more prominent behind.

I throw the above out as a hint for cutters who may go to female tailoring. The time will soon come when men will pay more attention to cutting and fitting female garments because it will pay better, and some one may possibly be benefited by the above suggestions. Knowing what I know to-day, I would, if I were fifteen years old again, or even twenty, go to work and learn FEMALE TAILORING.

ANGLE OF FIFTEEN DEGREES

FOR COATS AND VESTS.

(SEE DIA. XIII.)

IF we take a square piece of paper and encircle the body from under the arm to the waist it will fit perfectly, although, when on the body, the front will be 15 deg. higher than the back; and if we want to form a level waist, we must attach a piece to the bottom of the front, amounting to 15 deg., as shown in Dia. I and IV. If we extend that piece of paper, or cloth, down to the side of the thigh and seat, we must cut it open at the side of the hip and below the waist, and insert a piece to accommodate the spread of the body, as shown in Dia. I. But the spread of the garment all around the lower body could be made better if two cuts were made—one at the side and the other near the back—representing the front and the back seam of the frock coat sidepiece.

Dia. I represents the body of a coat, that is, from arm to hip, in a position which it has to assume, when upon the body, and it must be observed that a garment, spread on a flat table, can only be in harmony with the body at one point; all other points must differ, and can only be correctly located by their true relation when on the body. This, I claim, is nearly the natural position of the garment when upon the body, and would require no seam at all below the arms and above the waist. If this piece was not wide enough we could enlarge it to the size desired, and wherever necessary, and would make no difference in the fit so long as the seams are allowed for. When taken off the body it will fit the flat table just as well as it did the form of a man. In this position of a coat, as on Dia. I, or a vest, as on Dia. IV, it makes but little difference if the side seams are cut a trifle more forward or backward—the fit will be the same.

I therefore claim that all changes in the seams, as the vest, frock and sack coats, must be made while in position, as in Dia. I and IV, or at least must be made on lines 9 and 14, etc., whenever the back is obliged to assume an unnatural position, as in Dia. II—all of which is further explained in the article on "Narrow and Broad Backs."

But we must go back to the angle of 15 deg. If we take a square piece of cloth, representing the $\frac{1}{2}$ breast measure of a 35 coat, we will have $17\frac{1}{2}$ inches each way. If we add an angle of 15 deg. to one of the sides it will give us an angle of 15 deg., although the top point is lost, but would form like the upper part of Dia. XIII. The angle of 15 deg. spreads $\frac{1}{4}$ of its length; consequently it spreads 5 in. in 20, as seen in all diagrams in this work, with the front angle of 15 deg. attached.

Line 20 is located at the top of the hips, where the body spreads considerably, and the hip measure may be considered as large as the breast measure, though in different positions, as the hips spread more sidewise. The front line of the attached angle of 15 deg. is, at the same time, the front line of the angle of 135 deg., as well as the front line of the square of 20.

Now observe, that in changing the lines on the square of 20 in. into a square of $17\frac{1}{2}$, with the angle of 15 deg. attached in front, the front does not change a particle, but the back, at the waist, is detached and thrown backward and upward, becoming larger at the waist and smaller on top, and forming the angle of 15 deg.—all

the spread being toward the hips and seat, representing a garment without lap and without gore at the hips and seat, and without any waist suppression. Below the front of the waist the body recedes, and the front of the angle of 15 deg. is cut off accordingly, and runs straight down with the plumb line, as shown in the diagrams.

But this is not all. The angle of 15 deg., as in Dia. II, represents a straight but pointed or funnel-shaped piece of cloth, has its proper size at the bottom of the armhole, at the hips and seat, and front of the chest and waist, but is too large at the hollow of the waist above the hips and seat; and in this position gores must be taken out to imitate the hollows of the waist at the side and back. Not all is taken out, but only a portion, just to show the outline of the form; and if everything else is well proportioned, $\frac{1}{2}$ inch more or less cloth at the waist will be of little consequence. It is of more importance to ascertain the depth of the seat and hollow of the waist, so we may know where to run out the gores, or where to make it the most hollow.

Line $17\frac{1}{2}$ on the front plumb line may be considered the hollow of the waist for the normal form, and the seat may be located at 27 or 28, but on extremely short or slim persons these points should always be measured with care. In cutting according to the rules adopted in this work, the outside of the elbows can always be depended upon for the location of line 20, and the hollow of the waist is $2\frac{1}{2}$ numbers higher, all to be measured from top of back. For the seat point, take the largest part or the upper point of the thigh bone, which corresponds to the wrist, the arm hanging down.

If the half breast can be fitted with $\frac{1}{2}$ breast measure and $2\frac{1}{2}$ in., all seams included except what the lapel takes up, the hip can be fitted with $\frac{1}{2}$ hip measure and 2 in., all seams included except the lap of the buttons and button-holes, because the hip requires nothing in consequence of expansion, as the chest does. If the hip measure is the same as the breast, say $17\frac{1}{2}$ in. for the half coat, then it follows that the hip, at the waist seam, may require $19\frac{1}{2}$ in. and about $\frac{1}{2}$ in. for lap of button-holes and buttons, making 20 in all. This must be the result, no matter if the draft is made like Dia. I or Dia. II. In Dia. II it will be seen that whatever the hips spread at line 20 is again reduced by the gore in the center of the forepart, as well as by a small reduction from the center in front. It should be observed, that, although the breast and hip may measure the same, the form is different at the hip than at the breast. The front is compressed and spreads sidewise at the hips, just like Dia. I.

Observe that the square of $17\frac{1}{2}$ and the front angle of 15 deg. measure $22\frac{1}{2}$ in. for size 35, at line 20; and it follows that $2\frac{1}{2}$ in. may be reduced on and along line 20. Dia. II, and all others laid out in the square of $17\frac{1}{2}$, are not only based on the above calculation, but are founded upon years of trial, and virtually the calculation is made from facts so obtained. This is also the way in which all the other diagrams have been produced. The angle of 15 deg. will fit the normal form at the arms, at the largest part of the seat, at the side of the thigh, and the front of the chest, but is too wide at the hollow of the waist behind, and stands off below the front of the waist, and must be reduced by gores as shown. On the back, it must be considered on a plumb line, spreading sidewise and forward.

The tritling spread below the side of the thigh is taken off by the gore in the center of a frock coat forepart, and is turned forward between the skirt and forepart; while on a sack coat it is partly cut off between the back and side seam, which is further forward than the frock coat skirt seam, and by which the gore in the center of a frock coat forepart is balanced. Now, in this position, it might be reasonable to make calculations for waist reduction by comparing breast, waist and seat measures, but as the waist is not to be fitted at all it would be useless unless we could take the measure just as wide as we wanted the coat at the waist, which cannot be done satisfactorily; therefore, we take the average, and cut out the waist in proportion to the breast measure. But it can be done only after the angle of 15 deg. is established, and recognized as a base, and understood, according to the principles adopted in this book.

But I must again call the attention of the reader to the plumb base on the back. The angle of 15 deg. is based upon a plumb line on the center of the back, both shoulders and the seat touching said line, and the front line of the angle of 15 deg. running forward and away from the body below the pit of the stomach, while the back runs straight down, as a coat must hang, as is shown in Fig. II. The back plumb line is not given in Fig. II, because it would interfere with the diagram above.

I do not claim that all men walk in that position, but tell a customer to stand before you for measurement and he will usually assume that position. In walking, a man is inclined to lean the upper portion of the body forward more or less; but leaning forward or backward the line from the shoulders to the seat is carried along, and the base will remain the same from the shoulders to the seat, and in a large majority of cases no attention

need be given to altering either back or front; but there are extremes, and these do require a change there. A form may be stooping, or erect, but still may carry the shoulders and seat on a plumb line. Such forms require no change at the waist, but at the neck only; and a cutter must always observe such positions, because no so-called balance-measure will indicate it. But there is the so-called "sway-back," who carries his shoulders way back of the seat. Such a form requires his coat reduced at the waist, not between the back and sidepiece, but between the sidepiece and forepart, unless a large waist requires or takes up that space again. We often see large-waisted and always erect forms with their coats too tight over the back tack, because the waist is not large enough for the hips. How much the reduction at the side should be must always be determined by the judgment of the cutter; but an outlet at the side of the forepart is more important than anywhere else—it will never do any harm and may become very handy sometimes when it is least thought to be necessary.

When a coat swings off behind it can easily be brought to the body by stretching the whole back and back of side seam, from the shoulder-blade downward; but when it is too close there, more width must be obtained by the help of the outlet at the side of the waist, and by stretching the sidepiece downward on the forepart, in order to force the width backward. Coats which appear too close at the back tack are usually so because the hips have not cloth enough, when an outlet is very handy again; but this seam should always be sewed by hand, because a machine-sewed seam will show when let out.

All outlets around the neck do more harm than good; and if they are left on, for the purpose of trying on, they should be cut away before the collar is sewed on, especially on heavy goods. A coat that is too loose around the neck can always be brought to the body by taking up the shoulder seam, which will reduce the length of the forepart, and leaves the back correspondingly longer.

The normal form represents a slope of 15 deg. forward from neck to waist, but a large-waisted form may represent an angle of 20 deg., and consequently such a form requires an addition in front of waist and outside of the front base; and I find that a large-waisted form requires from 1 to 1½ in. extra allowances in front of waist on a vest. The angle of 15 deg. measures 5 numbers at line 20, hence every 3 deg. measure 1 number at the point. Every corpulent individual should be measured according to the front slope of the chest. I know it is an odd measure for a beginner, but a little practice will make it plain work, and it will pay well. I do not claim that the measure must be taken absolutely correct, but it should be nearly so, so that an idea can be formed of what a person may want.

The angle of 15 deg., with a width of ¼ breast, or its equivalent, as 17½ numbers for a vest, or 18 numbers for a coat, at the starting point of a garment, which is the angle of 135 deg. within the angle of 15 deg., as seen in Dia. XIII, contains the proper spread for, and around the hips and seat, as required for a coat. For waist suppression at the sides and the back, gores are cut out, according to notion or style, or according to the nature of the garment. It must be remembered that the position of the shoulders and the whole forepart is the same in all diagrams in this work, and that the change from the square of 20 to the square of 17½ is made by changing the back, or the sidepiece, or both.

Now it will be seen, that if either of the back or sidepiece is moved, but kept together on their connecting points, as on lines 9 and 14, etc., the gores must change, as well as the height of the back above the bottom of the armseye and on line 9 over the front. Thus the back or the sidepiece may be laid in any conceivable shape, and in any conceivable square, and the fit will be the same, though all points assume a different relation to the starting point. The angle of 15 deg. is here adopted because it conforms to the slope of the body and not as a pet idea, and it is also adopted for the reason that a garment can be laid out in it, without piecing the garment, or cutting out unreasonable amounts as gores.

Dia. II shows the whole coat on the angle of 15 deg., and the gores around the waist are for a normal form of a size 36, that is, the waist suppression is one-ninth part of the whole breast, or about 2 in. in both gores around the side and the back, on the half coat. This is the reduction within the angle of 15 deg., when on the flat table, but when sewed together, the garment will form like Dia. I, or nearly so, and when in that position, the seams around the back of the waist may be changed some, without destroying the balance, but as a general thing the seam between the back and sidepiece should not be tampered with, unless there are good reasons, such as style, or for erect forms, where the folding up of the sidepiece will contract the gore between the back and the front skirts or close it up altogether, or in extreme cases produce a lap over the seat. Fuller waists are usually of erect forms, and for such the under-arm cut may be reduced for the larger waist, and the gore between side and back

may be reduced at and below the tack. That cut, or gore, between the back and the sidepieces will always be a difficult thing to handle, for the reason that it is a curved gore.

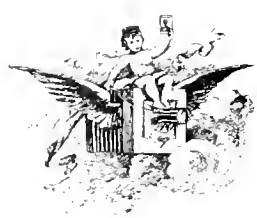
If we would cut the back of Dia. II 1 in. wider over the blade on one coat, and cut another one 1 in. smaller at the same point, without changing the lengths of the back above the armhole, we would spoil both of them, unless we know how to make things right again by sewing the parts together. On the broad back, with a straighter seam, the sidepiece would have to be reasonably stretched over the blade, or the back held full, which is the same, while the more narrow and more curved back must be sewed on the sidepiece rather close, though it will never do to hold the sidepiece full, or stretch the back there.

Dia. II is so calculated that both sidepiece and back must be sewed on even over the curve, above line 9, and the best of tailors will sometimes be compelled to baste them together several times more than they like, before they get them right, or the way it is intended. Here we can find the reasons why certain parts can be worked the very contrary, and both ways will fit, and for this reason a newly-arrived jour should be thoroughly instructed by the cutter, as to how things must be put together according to his cutting, and the cutter himself should be a good tailor, or at least he should know how it is to be made, even if he can not do the sewing. A cutter who is a thorough tailor himself will always be a better cutter than the one who only knows how to cut, all other things being equal.

The angle of 15 deg., as used in this work, is calculated for the normal form of a male. Males with extra large hips require more spread toward the side of the hips, and must be placed under the head of abnormal forms. The normal form of a female is very large over the hips, and the angle of 15 deg. would not produce spread enough for a female. It is true, this work has nothing to do with the cutting of female garments, but I think it important enough to point out the above difference between the male and female form, for it may become of use to some of my readers. Soon the time will come, and, in fact, it is now and has been for some time, when men will cut and superintend the making of fine female garments, just as females now make the common garments for men. There are millions in it.

The angle of 15 deg. is taken as a standard in this work, because it is easily found by spreading two lines one-fourth of their length. It is also a common division of the square—one-sixth. It is also the twenty-fourth part of a circle. It is not an unknown quantity, but something recognized and acknowledged by the whole world. Now, if anyone contends that a larger angle, or a smaller one, is better, I will not find fault, but I would like to see the proof.

The angles, as laid down in this work, are a standard—something rational to go by—the same as a pound or a yard. Our grocer never sells an actual pound of coffee, nor does our dry goods merchant sell us an actual yard of calico, and we all know it, but we are satisfied with it because we can do no better. It serves the purpose. I claim that two angles of 15 deg., formed in funnel-like shape, and connected at the widest part like Dia. XIII, will at least come nearer to the shape of the human form than a square piece.



THE SQUARE AND THE CIRCLE.

THE square is a very handy instrument for the use of men, both in squaring material for building or for squaring our actions in the intercourse with mankind; but as the Creator is greater than the creature, so is the circle greater than the square. The great majority who may read these lines will acknowledge the existence of a Supreme Architect of the Universe, no matter by whatever name it may please individuals to call him. Even the so-called radical unbeliever when cornered will acknowledge that the Universe has been made and is kept up by something which he cannot comprehend, but which he cannot deny, but he calls it Nature. Very well, let us call it Nature, and give praise to the work of Nature. But the great majority have seen fit to call it God, and this name is again spoken differently by every language of the globe, and I suppose that is the case with all intelligent beings on any heavenly body that may exist. This being the case the name is nothing.

Now, when God made the heaven and the earth, he did not use a square, for there is nothing that indicates anything like a square. The whole Universe is laid in a circle, and as far as our vision reaches we behold everything round, and, according to Genesis, when God made a covenant with Noah, He sealed his promise with the beautiful curve of the rainbow. Every star is round, so is the earth, and even its three-fourths surface of water, which constitute the mighty oceans, are in a perfect circle; and everything that grows upon the earth is more round than square. We may go anywhere, and everything that we behold points out that the Great Architect of the Universe formed his plans within the radius of a circle.

In humble imitation of this divine principle, I have adopted the circle, and parts of the circle, within which I form my plans for the covering of men, which became necessary after Adam and Eve had tasted of the forbidden apple, which, I suppose, was round, too. (See Dia. XI and XII.) But I may have made mistakes. Making mistakes is natural to every person. The brute creation make no mistakes, but do they advance? The spider weaves his web as perfectly as his ancestors wove theirs thousands of years ago, and in all probability will do so for thousands of years to come. He makes no mistakes because it is not in his nature to do so; but neither does he improve; he can not even transmit his skill to any living being, unless of his own specia. Man alone is capable of improvement, and because of this, he is liable of making mistakes; for, what would become of him if he proved successful in all his undertakings? Making mistakes is a wise check, which the Creator has implanted in the nature of man to prevent him from getting ahead faster than what is good for him.

The wise man learns from mistakes, either from his own, or those of others, and the man who never makes a mistake, will never grasp a valuable idea. Mr. Ingersoll pitches into Moses, because that master mind has made mistakes, as he claims, in writing Genesis, but notwithstanding, the name of Moses is before the world, as a mighty pillar of truth, and no man has yet been able to improve upon the ten commandments, as laid down by that great lawgiver. If some of the old masters have made mistakes, they certainly have left us some valuable substance, from which sensible men will gather wisdom, while fools throw slurs.

VESTS.

(SEE DIA. IV.)

THE square consists of 20 numbers. Height of back, 14; height of front, 9; shoulders at an angle of 135 deg.; top of back, $3\frac{3}{4}$; gore under the arm, $\frac{3}{4}$ at line 15, $\frac{1}{4}$ at line $17\frac{1}{2}$, 1 at line 20. Sink the front bottom of the forepart 15 deg. for a pretty square bottom. On the garment from the neck to the ankle the vest is on a square of $17\frac{1}{2}$. On this square the height of the back remains 14, but on the front plumb line it is $11\frac{1}{4}$; the gore under the arm is $3\frac{1}{4}$, and the bottom is square, while the front has an angle of 15 deg. attached. The square of $17\frac{1}{2}$, with the angle of 15 deg. in front, is virtually nothing but an angle of 15 deg., having, at the starting point of the garment, a width of $17\frac{1}{2}$ numbers, according to scale. (See Dia. XII and XIII.)

Top of back is as wide as the angle of 45 deg. at the neck, but may be made $3\frac{1}{4}$. The back must be that wide, in order to bring the spring of the collar to the side of the neck, and again, in order to enable the vest maker to sew the vest back all around, and turn the whole vest through the neckhole. If that hole is too small, the back is apt to tear, while the vest is turned. The bottom of the collar band is on a straight line from $11\frac{1}{4}$, on the plumb base line, through 5 on the top square line. This collar band, as it is here cut, requires that the top and side of the back must be stretched, say $\frac{1}{4}$ inch, on each side, and close to the shoulder seam, and it is for this reason that the top of the back should be $3\frac{1}{4}$ wide, in order to bring the stretch as far forward and to the side of the neck as possible.

If this is worked right it will make a neat collar, and a neat shoulder, but if the vest maker can not be depended upon, it is better to allow $\frac{1}{4}$ inch spring, and starting said spring at the middle of the shoulder seam, which is about $2\frac{1}{2}$ in. from point 5, and sew the back even on the neckband, but in no case must the back be held full. If anything is to be the fullest, it must be the neckband, which must in all cases be cut plenty long, and the vest maker must be instructed to fit the two together, as above directed. The junction of the neckband, or the so-called standing collar, is further explained in the article on "Collars."

It will be seen that Dia. IV has the shoulder on the plain angle of 135 deg., and that there is neither lap nor gore. A trifle spring that is required for a vest must be worked in by stretching the top of the back close to the shoulder seam. Dia. IV is so represented for the following reason:

I intended that Dia. V and VI should both be represented with a perfect shoulder slope of $22\frac{1}{2}$ deg., and that Dia. IX should have the perfect shoulder slope of 30 deg., all of which were made over the same pattern as was Dia. IV. But Dia. V and VI are cut $\frac{3}{4}$ of a number further sidewise at the side of the neck, because in the position of the shoulder seam of Dia. V, the neckband can not be cut on, for the reason that the spring for the side of the neck would locate too far in front. Both Dia. V and VI are for illustration only. If I had placed a spring of $\frac{1}{4}$ inch at the top of the shoulder seam, the shoulder slopes as shown in each of Dia. V and VI and IX would have to be changed, and make the angle of 135 deg. a mess of confused lines.

If the collar opens very low, and a very hollow curve is required, the upper part of the neckband must be cut higher, say one inch, at the upper end, but the same at the shoulder seam as shown in Dia. IV. This will give a chance to cut a nice curve or open front, especially for a double-breasted vest, intended for very open fronts. But cutting the neckband higher on the upper end destroys spring at the neck, and for this reason an extra spring must be given in the shoulder seam. If the neckband is raised behind, say 1 in., an extra spring of $\frac{1}{4}$ inch must be allowed at top of the shoulder seam, no matter if it is cut like Dia. IV, or if $\frac{1}{4}$ is allowed already. Forty years of tailoring has convinced me that Dia. IV is the best for all kinds of vests, because the front collar may be curved at pleasure, and the collar is simply a piece added for the turn-down part, and always fitting to the neck-hole of the vest. In order to make the top collar conform with the curve of the neck-hole, the inside part of it must be pretty well stretched at the most prominent part of the curve. Dia. IV is plain, and is cut with the neck-band on.

Dia. V is cut in a square of 10, or ¼ breast and 1¼ in.; the neck-hole is cut out at the center of the neck, or at 67½ deg., hence the back and front of the neck-hole are equal; the shoulder slope is taken out at the center of the neck, and when connected will form the same as Dia. IV, except the neck-band. Dia. VI is Dia. V simply doubled. The solid lines represent one-half of the angle of 135 deg., or an angle of 67½ deg. The dotted lines passing through the neckholes of Dia. IV and VI may be called the grand center lines, and would fit a human form decapitated; and it will be seen that the actual neck-hole, from that line, is just half the diameter of the neck.

The waist of the vest is calculated upon one-ninth less than the breast, whole measure. The under-arm cut of "one" makes a close waist, and may be reduced to three-fourths, or even to nothing, for a large waist. (See Odd Forms. The square of 20, as for a vest, is reduced in front from the pit of the stomach down, or where the body turns backward, and whatever is taken off in front is again added behind; hence the spring over the seat, which really does not at all change the dimensions, but gives it a different direction by reducing the front and by enlarging the back, and when all this is done the waist is reduced, say 1 in., under the arm, as in Dia. IV. The turn of the front is higher up than in the back, and the front is to be even between 9 and 15 on the front base, from which points it turns backward both up and down.

Dia. IV represents a vest to close all the way up to the neck. It gives the whole front edge, and may be cut lower to satisfy notion or style. The whole front of Dia. IV is such that it can lose one seam to turn in the edge, but if the vest is otherwise well-balanced it will not injure it if the seam is allowed to remain, and the edge bound as it is. A difference will be noticed between the straight front of a coat and the straight front of a vest. On a coat usually worn by the clergy the buttons and front of button-holes may be placed one seam back of the front line of the angle of 135 deg. down, as far as line 17½, which results in the same thing as when we cut the front off on that line, and sew it up with a seam. The vest is to fit a trifle more snugly at that point, and after one seam is turned in, or cut off, there still remains one-half for lap of buttons and button-holes.

To regulate the top buttons of the vest and coat, the top coat button may be placed ½ inch lower than the top vest button, and the coat will cover the vest when buttoned, providing the coat lapel is 1 in. in front of point 9. It is of very great importance for a cutter to be able to regulate the above points, and this is one reason why I have placed all coats and vests on the same base; which is on the angle of 135 deg. The vest arm-hole touches lines 9 and 14 at the bottom, and the angle of 45 deg. in front, but may be ½ inch deeper and ½ more forward for a person who desires plenty of room.

At the breast line, a vest is plenty large enough if it is ½ breast and 2½ in. At the hip line, ½ hip and 2 in. is large enough, because vests are left open below the hollow of waist. If a vest is to be sewed up clear down over the hips, the bottom must have a width, which corresponds with the hip measure, when sitting down, after it is finished and buttoned up, or ½ hip and 2½ in., the same as the breast. At the waist, a vest must be treated on the same principle as a pants, that is, it must be made wide and comfortable enough for the waist when a person sits down. At the waist, a vest is shut up all around, and can not give, and provisions must be made for expansion when sitting. Such allowance depends upon the condition of the body at the waist, and like on pants, this measure may be taken in a sitting position. But a variation may be made between persons who are mostly standing, and those who are mostly sitting. The sitting person requires a larger waist partly allowed at the side, but mostly in front. The normal form requires the vest as large at the waist as it is over the hips, and the square of 20 gives that width, by reducing about 1 in. at the under-arm cut at the waist.

In Dia. XIII will be observed a dotted gore in the back, extending through both pants and vest, which gore is cut out on a pants, but on a vest it is usually buckled up. A vest made without buckle-straps should have that gore cut out.

At the front of the collar, the underside should be cut so that when it is sewed on it will pull the vest part over so much as to hide the under side when the top collar is finished. The inside part of the top collar must be pretty well stretched back of the curve, and if the material is not bias, and can not stretch, a "V" must be sewed in, after which the whole top collar must be shaped as it is required by the curve. This may cause some extra work for the maker, but that is the only way to produce a low opening with a hollow collar, especially on double-breasted vests. The edge of a collar should be finished about 1 in. above the shoulder seam, and the under collar cut away entirely. Over and across the back there is no need of anything but the double top collar, which is simply sewed together with a seam, which is pressed out, the top collar doubled up in shape, and the back stitched on top of the collar. On heavy goods, the top collar seam of a vest should be drawn together to make it thin.

The front and the bottom of a double-breasted vest requires especial attention, in order that the parts which lap under, or over, do not show the front corners on each side, or that the top side runs too high up. Rounding off the corners pretty well will remedy the evil to some extent, but it does not look well, or a customer may order an even bottom of front, as in fact, all such vests should be.

The following will make a good front: Sweep from the point of the angle of 135 deg. through the bottom of the front angle of 15 deg., and add say $\frac{1}{8}$ to $\frac{1}{4}$ inch more roundness to the bottom at the center between the front edge and the buttons. That sweep *may be used for the whole* bottom of the front. From the front line go back $2\frac{1}{2}$ in. for the button line, and allow in front of line 9 $1\frac{1}{2}$ in., and on the bottom allow 1 in. in front of the front line, and draw a straight line for that front edge. If the lap is to be more or less, set the buttons that much backward or forward as the case may be. A double-breasted vest which is to button clear up to the neck must have at least a gore of 2 in. under the lapel, and the top button must be set back as far as the width of the lapel. A double-breasted vest should have a small gore under the collar, even if the collar is low down, and the depth of the collar must be made according to the measure, and the collar itself may be made straight or with a large curve the same as shown on Dia. IV.

The sweep from the point of the angle of 135 deg. will give the whole bottom of the forepart as shown on Dia. XI and XII, and the double-breasted front may be shaped just like it, but may have a trifle more in the center of the angle of 15 deg., and that trifle may be obtained complete by a sweep from $3\frac{3}{4}$ on the plumb base line through the front angle of 15 deg. only. It should be observed that each particular double-breasted vest requires particular care, in order that the bottom of the front, as well as the front itself, and the collar is correct, and that the buttons are on their places. If it is desired to sink the front down further than the sweeps, add equal distance, say $\frac{1}{2}$ inch at the button line and at the front edge, and both will remain in balance. It will also be found that a double-breasted vest can be improved, by making the back $14\frac{1}{2}$ long above line 9, because the front will have a better chance to settle in its proper place.

Nor should it be forgotten that a double-breasted vest, which has to lap over the oval center of front, can not set without a break somewhere, unless there is a gore cut at the waist, or under the collar; or, the front is drawn in pretty well under the collar, which is the same thing as cutting a gore. (See Supplement.)

FROCK AND SACK COATS AND VESTS.

DIAGRAMS I and III are given for illustration only. Dia. II may be used as a model by which to cut all frock coats. A pattern of Dia. II was used to form Dias. I and III, and they should all come out the same as to the fit. It may be, that in transferring Dia. II in the different positions, a slight difference may have been made, but it must be admitted that it is rather a difficult undertaking to transfer the same pattern into different positions and always have it work out the same to the smallest fraction. Dia. II should be considered the parent pattern, and after the division of the angle of 135 deg. has been mastered, anyone who knows his A, B, C's ought to be able to make the coat draft. But as this work is intended for beginners as well as for the old and experienced cutters, I consider it worth the while to give a minute description of its cuttings as well as of its making up.

Be it understood that the angle of 135 deg. and its divisions, as bases, are the same for all frock and sack coats as well as for vests. All must be worn over the same body, and all must have the same base. But although coat and vest surround the same form, each has a different function; hence the difference in the construction of the neck-hole, the centre of the front and other points.

Notice this fact—that the top of the back of a vest is placed at $3\frac{1}{2}$ from the point of the angle of 135 deg., or $\frac{1}{2}$ lower than on a frock coat. Now, in the first place, the vest collar should be lower than the coat collar; and secondly, the front of a vest is cut nearly straight down at the waist and all surplus cloth cut away sidewise, or buckled up behind—all of which has a tendency to shove the vest backward and upward to the neck. Hence the top of the vest back is $\frac{1}{2}$ lower than the top of the coat back. It should also be noticed that the vest and sack coat back, above the armseye, up to 135 deg., is shorter than the frock coat; and it is so for the reason that is set forth in the article on "Narrow and Broad Backs."

A vest is intended to fit best in front, and the height of back should never be less than 14 above line 9 in front, because a short back over the blade is apt to cause the front to be too long around the neck. On the other hand, a coat is intended to fit best in the back, and for this reason a sack coat back should never be longer than $13\frac{1}{2}$. The sack coat, being some shorter in the back and looser at the side, has a tendency to fall away from the neck; and for this reason the top of back is placed at 3. Again: The overcoat must cover the collar of the undercoat. For this reason the top of the overcoat back is placed on $2\frac{1}{2}$. The side of neck, at 60 deg., should not be closer than $3\frac{1}{2}$ or $3\frac{3}{4}$, which allows the collar to be sewed on easily at the side.

Now, it is true that there can be no difference between the height of the backs of frock and sack undercoats, and I do not claim that there is any, although Dia. II has a height of back of 15, on line 9 of the front base; but according to the combination of frock and sack (see Dia. III), when the sidepiece is turned down and in at the waist, and all parts are even at the back and the under armhole, then the frock and sack backs are equal in height. The foregoing comparison, as well as what has been said in the combination of sacks and frocks, is based upon more than ten years of experience, and it is repeated here for the reason that this question has been more or less agitated in the different fashion journals for many years without any satisfactory result to cutters in general.

For the frock coat in particular see Dia. II. It may be useless to recapitulate their points, but I must again remind the student of the fact that the connection of the sidepiece and back must be made at lines 9 and 15. The back and sidepieces are on even lines at the waist, and below line 9 and 15, and it is only necessary to allow one seam at the bottom of the sidepiece, as the back is in one piece. In order to get the top of the sidepiece long enough for the back, the sidepiece must be run out into the armhole for that purpose, with a small gore of say $\frac{1}{4}$ inch at the armhole. It is important to know exactly where to make the connection, and instruct the journeyman to sew up and down evenly, or to stretch or "full" certain parts above and below, as the case may require.

The gore between the sidepiece and the back always requires careful cutting, especially over the blade. In Dia. II the gore at lines 9 and 15 is put at 1 number, and I must here state that this is as much as any coat may require, and if the gore there is made only $\frac{3}{4}$, it will not spoil the coat, but it may do good, and make the coat feel easy in the back. A coat cut out too much there will feel small in the back whenever the arms reach forward. It is true, this can be helped by cutting the armhole forward, but will be at the expense of some other point, which will be disturbed. A coat cut too tight at that point will show too much back at the point of the blade, both in length and in width, and I will here again say that if you desire a loose fitting coat, a coat that fits, too, cut the gore at that point not over $\frac{1}{4}$, running up and down, and making the same connection at the point of the blade and at the hollow of the waist as in Dia. II.

I have been particular in writing about the gore between the sidepiece and the back, and a cutter must always watch the same, because the peculiar making by this or that journeyman will draw it out into a different shape. The back may be called the face of a coat, and it requires constant watching on the part of the cutter. At lines 9 and 15 the back should not be cut less than three numbers wide, and the whole calculation in regard to the height of a frock coat back is made with a back, three numbers wide at that point, and the calculation for a sack coat back is made with seven number width at line 9. At the waist the width of the back depends a good deal upon the size of a coat. A large size may have enough with two numbers, while a small size may have two and a half numbers. A back 2½ in. wide at the tack, will not be far out of the way for almost any size.

The position of the back and sidepiece requires both to be sewed on smoothly. Never hold the back full over the blade, nor sew a large seam over the curve. A back may easily be made too full or too long by fulling it over the blade, either by doing so in basting or in sewing a deep seam over the curve, and the more curved the sidepiece is the more will be the danger of fulling the back, or going to the other extreme and stretching it.

Below the lines 9 and 15 the back and sidepieces should also be sewed on smoothly, particularly so for pretty straight forms. Should the form bend a trifle forward, without being stooping, the sidepiece may be stretched, or the back held full, say $\frac{1}{8}$ to $\frac{3}{16}$ of an inch, at the hollow of the waist. Or, if your coats have a tendency to be a trifle loose behind, stretch the back sidepiece a trifle above the waist, and you will find that it will improve the coat. Or, if the coat is a trifle loose after it is made, you can improve it greatly by stretching both sidepiece and back; and if the lining is not long enough it must be opened and let out, or pieced if necessary.

It is wonderful what a different appearance you can give to the back of a coat by making the back and sidepiece lining longer or shorter. The peculiar manner of different persons in sewing the seams, or basting in the lining, will also have a decided effect upon the appearance, if not upon the fit itself, and a good cutter must understand all that; that is, he must be a good coat-maker, otherwise he will always be in trouble. In recent years the question has often been asked: "Can a cutter be a good cutter without knowing how to make a coat?" I, for my part, would answer: "Yes, certainly; but if he could make the garments he cuts, his services would be worth a hundred per cent. more."

But right here let me put another question: "Would not a good coat-maker be a better coat-maker if he knew the principle by which the coats he makes are cut?" And, in answer, again I say: "Yes; a thousand times." Cutting and making must go hand in hand, and whenever a cutter understands both, he is able to give positive instruction to a journeyman workman. If not, he is not "boss" over the back shop.

Over and along the hips the forepart and part of the sidepiece should be stretched, say about $\frac{1}{2}$ to $\frac{3}{4}$ of an inch, and the top of the skirt should be shrunk about that much, so that the gore in the skirt, which is not cut out, is shrunk away; and the gore between the sidepiece and front, which is cut out, is stretched out again at the seam, and the skirt, forepart and sidepiece are sewed up just as shown in Dia. II. The gore between the sidepiece and forepart might be run out at the waist seam and both cut equal without stretching or shrinking either part, but it will throw the fullness over the hips too much on one point. The back skirt seam should be oval to imitate the seat. At the center of the back, and from the tack downward, the frock coat is sprung out, say 1¼ inches at line 30, but said spring is again reduced between the back and forepart. On a short sack the oval form over the seat can be partially produced by cutting the back seam oval, which, when sewed up, will produce the oval form. But on a frock coat, which is open behind, the oval center would simply produce a rounded edge at the back, but not the oval shape of the body. Now, whatever is thrown out over the base behind is again taken off or balanced between the back and front skirt, and shaped to fit the form, will remain oval when sewed up.

The width of the back skirt depends upon notion or style, but when made up the fold and the edge of the top tack should run parallel on both sides. The shoulder seams ought to be sewed on evenly, but as the back is always more bias than the front, there is danger of stretching the back, and the seam should be so basted on that when held up without strain the back would be a trifle the most full. It is also a good idea to notch the shoulder seam in its center, and baste up and down.

In making up, the front of the arm-hole must be well stretched; then starting from the front sleeve nick up say 1 in. back of 60 deg. For this purpose the canvas and all padding should be cut into at three or four places, and fully 2 in. deep. Then about 1 or 2 in. above the front sleeve nick; the lining should be cut through and a "V" put in. All of these cuts should be so finished and again filled up, that when the coat is done no off-set will be visible on the outside.

The front of the arm-hole is guarded by three notches, and needs no further description; but I must caution against an error in regard to the under sleeve. It is frequently contended that the under sleeve should be sewed in tightly over the sidepiece, but this is a mistake. An under sleeve which is held a trifle full over the back and sidepiece will "set" far better than one that is stretched away at that point. This is on the same principle that the top sleeve will not set well if stretched at and above the front sleeve nick, or anywhere else.

When a back under sleeve drags or shows too much sleeve, it is a sign that the arm-hole has too much space somewhere over the back, and it must be reduced. Stretching the sleeve will never make it better. But by sewing in that part of the sleeve a trifle full, I do not mean that we should stretch the arm-hole *that* trifle. It should be secured by a suitable stay, or a solid thread drawn in, which will keep it from stretching, though the sleeve is a trifle full. All linings around the back and arms must be loose and large, and may be cut bias. The back lining should be provided with a fold as well as the under arm cut.

When I use the term shrink or stretch, I mean just what I say—not to hold one side full, and sew it together, and then press it out as best you can. A seam sewed, and particularly a machine-sewed seam, cannot be stretched satisfactorily, for it will largely return and draw the other side full. But a seam stretched before sewing up will remain so. This holds good on all seams and on all garments, particularly so on pants.

GARMENT FROM NECK TO ANKLE.

SEE DIA. XIII.

JOIN two angles of 15 deg. at the front of waist and back of seat. At a point where the upper angle of 15 deg. is 17½ numbers wide, is the starting point for a coat or vest. For the reason that the diagram contains the full width of a coat, it is too wide for the pants, and the width is taken off at the side. The front turns at point 15, where the body begins to turn. The pants start at point 17½, and the pants and vest lap 2½ to 3 in., just as on the body. It is not intended for actual cutting, but simply to show the continuous form of the whole garment from neck to ankle.

This diagram can be used for night-pants, particularly for children; but for such purpose the distance from the starting point, at 135 deg., to the crotch should be made 30 numbers, so that there is no strain in the upper part and crotch. Nothing is to be cut out at the side, and may be made without a side seam. It will well repay any cutter to spoil four yards of muslin and make one for himself, just to try it.

This diagram shows the whole outside of the center of front and back, from one extreme to the other, and where both extremes have about the same circumference. The bare neck and the two bare ankles will measure about the same. The largest part of the body is in the middle and the center of front and the center of back run up and down in two angles of 15 deg. each, and the two angles are joined at their widest part. This is the side view of the body, and if the body were really flat, as it appears from a side view, the centers of front and back of a garment would have to be cut on the same curve as the center of back and front in Fig. II. But both centers are flat from side to side, and what appears a sharp edge from the side view of Fig. II is a perfect flat surface in Fig. I, and is actually flat, from side to side, but bent, as we can bend a flat piece of tin, and for which reason the centers of back and front can be fitted on straight lines, and must be fitted nearly so.

For illustration we will suppose that we take four boards each one a yard wide, and set them up in a joined angle of 15 deg., like Dia. XIII, and though we may look at its sharp edges from the side, we are compelled to use a flat piece of material if we will fit the front and back views; and the human form must be fitted just like it, that is, all cuts, or all wedges, as in Dia. I and II, must be made, or put in, from the side, and the flat centers of front and back must run parallel to each other. The centers of back and front, running parallel with the body, prevents the sides of the diagram to be in the same harmony, and for this reason the hips, which are the largest and widest part of the body, show themselves as the smallest in the diagram.

Dia. XIII is one of the illustrations upon which I have worked for years, until I have brought it out as it now is. The idea of joining the two angles of 15 deg. at their widest part, came easy enough, but the true position of the two points toward each other, and the fitting points, of all the garments in detail, kept me busy for more than ten years. To be sure, I did not work at it all the time, but on each garment I cut, I had to change this and that, either at the neck or waist of a coat or vest, or at the feet or at the waist of a pants, and the alterations I had to make afterward, and other indirect losses, such as misfits, and worse, loss of customers cost me a fortune; but I have the satisfaction of having been able to write down and record my experience, and if it does me no good, it may save some of my fellow men the trouble it has cost me.

COMBINATION OF FROCK AND SACK.

DIAGRAMS I, II and III are the same, and are made over the same pattern. Dia. I represents the center of the back running parallel to the center of front, as it must be when the garment is on the body. Back and sidepiece are connected at the hollow of the waist, within a square of 20½ numbers. The back's position, running parallel to the center of the back of the body, requires a spring over the seat and hip, starting at the hollow of the waist. Here it will be noticed that that square running parallel to the back of the body, meets the seat, and must spread apart to cover the seat, and the inserted spring furnishes the cloth required over the seat and hips. But what is put on behind must be taken off in front, for the run of the square brings it outside of the body in front of the waist, and must be reduced 15 deg. from the front of waist down, and the bottom of the front must be lengthened 15 deg. in order to make it level. If the center of the front and the center of the back be of any value as a base, then the base lines must run parallel to the front and back, or at least they must be so considered in order to obtain the amount which gores and wedges may require, or the location of the same.

In Dia. II we find the fore part in the same position as in Dia. I.; and, in fact, all fore parts are in the same position, and whatever change is seen is caused by the turning of the sidepiece or back, or both. But the back and sidepieces have been changed, and in place of their being 15 deg. out of plumb, we find them on a plumb line resting at the shoulder blade, and thence straight downward. Thus turning the back base 15 deg. will cause the original square of 20 to form an angle of 15 deg., or a curved line of 20½ numbers, which is the position of Dia. II. This diagram represents an angle of 15 deg. at such a width that it will cover the whole body, seams included, for a man's coat.

In order to find the width, the starting point for a garment is at a point where the angle of 15 deg. has a width of 17½, as in Dia. XIII. Hence the square of 17½ within the angle of 15 deg. That angle of 15 deg. represents a sheet wound around the body, which body we must here consider without arms. Said sheet closes in at the breast and shoulder blade, and at the side of the thigh and the back of the seat. In this position the back of the waist must be reduced by one or two gores, as on a sack or a frock coat.

Now let me say, that the theory of deducting the actual waist measure from the breast measure, and thereby finding the amount of gores to be cut out in the back of the waist, is a delusion, because the space which is taken up by that sheet at and around the waist is never measured. It so happens that the angle of 15 deg. requires a reduction of about 2 in. in all at the back of the waist, which is equal to 2 in. less than half breast. But the angle of 15 deg. is always the same, while the waist proportion changes. But suppose that the actual waist measure is as much as, or more than, the breast measure. Would not that same sheet, wound around such a form, require a reduction in the back? By using two bases in front, as the front base of the square of 20 and the front base of the square of 17½, which are just 15 deg. apart, we are able to shift the back from one base to the other—not to uncertain points, but just 15 deg.

The general plan upon which this book treats, is to work from the corner of a square, or from the centre of a circle, or from certain other angles, such as 7½ deg., 15 deg., 45 deg., 135 deg., etc. Dia. III is made for a purpose. It is likewise drawn within the angle of 15 deg., and is intended to represent the difference between sack and frock coats. Dia. II is arranged with a view to cutting purposes, for all parts are separate on a smooth surface, not in their natural position; but, by the aid of science, we know just how much they are out of their natural positions. Dia. III has the sidepiece changed, so that it laps with the forepart at the waist seam. In so turning the sidepiece down, the back will necessarily come along, and we find that it has shortened one-half of a number, on line 9 over the front. By turning the sidepiece in at the waist, the top of the back sidepiece seam falls backward one-half, thus making the square 18 for a three-seamed sack, as it is for a five-seamed frock.

The top of the sidepiece and back lap two seams, as they must be when sewed up, and the armholes are the same for both sack and frock coats. The lap of the sidepiece and forepart, and the lap of the bottom of the sidepiece and top of the back skirt, are explained as follows: A sack coat is wider at the back of the waist and runs down straighter than a frock. A straight line from the shoulder blade down to the seat is shorter than a line running down closer and in a greater curve toward the body. The circumference which the sack coat occupies at the back of waist is larger than that of a frock. The closer the garment fits to the body of the back the narrower it must become, and at the same time it must become longer.

Now, the position of the sidepiece in Dia. III just furnishes that extra length required, as well as the greater reduction in width. When the sidepiece is drawn even with the forepart at the waist seam, the lap of the sidepiece and the top of the skirt behind will crawl inward to the more hollow part of the waist, and the extra length is thereby taken up. The spring is not used in a sack, neither is the larger gore between the back and front; but both are omitted and a gore of about 1 in. is cut out, as for a sack, thus obtaining the larger width for the shorter back. The frock coat back has lost $\frac{3}{4}$ in length, hence the frock coat back on Dia. III is $14\frac{1}{4}$, while the sack coat back is only $13\frac{1}{2}$, for the reason that it is broader at the junction with line 9 over the front. When both backs are thrown down and into a square of $20\frac{1}{2}$, or in the shape of Dia. I, the frock coat back reaches line 9 at a depth of $14\frac{1}{4}$, and the sack coat back reaches line 9 at a depth of $13\frac{1}{2}$, but actually both have the same length from O. The extra length of the frock coat back and sidepiece above the bottom of the armhole is really a delusion, but the extra length of the sidepiece at the waist and at the back is used up, while the closer frock coat waist crawls more inward to the body.

Compare Article on "*Narrow and Broad Backs.*" For illustration, let us suppose we have before us a man with a well-fitting sack,—not one that fits skin-tight at the waist and spreads out below over the seat, but one that is just what the ideal sack should be, which is loose, yet showing the outlines of the form. Say we button it in front, and draw over the waist a tape-line. We shall find that the more we draw it together the looser and wider it will appear to be; and the bottom of the back will become too short, because the line closer to the body requires more length, which in this case will be drawn up from the bottom. It shows too much width, because the circle closest to the body requires less of it. But more of this will be said in the article on "Erect Forms."

For particulars, it should be observed that Dia. III is in a square of 18, and that Dia. VIII, or the three-seamed sack, is in the same square. A three-seamed sack would naturally be two seams less in the square than a five-seamed frock, which would bring the square for a three-seamed sack to $17\frac{1}{2}$. But the turning of the sidepiece causes the square to enlarge $\frac{1}{2}$, hence the square of a three-seamed sack is the same as on a five-seamed frock, or $20\frac{1}{2}$ numbers. See Dia. VIII B.

OVERCOATS.

FROCK, THREE AND FIVE-SEAMED SACKS.

(SEE DIA. X AND Xa.)

THE breast measure is to be taken over the undercoat, but close. The difference between an undercoat and an overcoat is just as much as the difference between a vest and an undercoat, and though all three garments pass over the same surface, and must fit the same body, each one has a different function to perform, and each of them is used for a different purpose. In comparing the vest and frock coat on the angle of 15 deg., we find that the vest has a gore under the arm at line 17½ of say 3½, while the frock undercoat has only about 2 numbers cut out in both gores, and, besides, the waist seam of the frock is to be stretched from ½ to ¾ inches—all of which will make the half frock coat about 2 in. larger over the hips than the vest. The frock overcoat requires the full angle of 15 deg. at the under arm cut and at line 17½, and a trifle lap at line 20. Besides, there may be a trifle more width allowed in the center of the back as well as in the gore between the sidepiece and back, say from ¼ to ⅜ at each point, all of which constitutes the difference at the side and back of waist between the vest, undercoat and overcoat. As long as the front of the overcoat falls straight downward ½ inch more or less such width amounts to very little, because the coat being open in front the buttons may be set forward or backward. If coats were open behind there would never be any trouble to fit the back, but the cutter's vexation would then be found in front.

Again, in comparing the vest, under and overcoats at the neck, we find another distinct difference. While the shoulder for a vest may be fitted with the angle of 135 deg., and could be produced equally as well without any shoulder seam, the undercoat requires say ½ inch spring toward the neck. The curving of the forepart at the shoulder seam is done to throw roundness toward the shoulder blade, for which purpose the shoulder seam is thrown backward at the arm. If the shoulder seam was located at the top of the shoulder, or where a vest shoulder seam is located, then that seam would admit of no curve, but would necessarily be cut straight, or with a spring toward the neck.

When a vest is finished, the collar will create a spring at the side of the neck, say about 1 in. on each side, which spring is required to turn upward and let the neck pass through. At and around the neck, there is perhaps a tie and a shirt collar, all of which is under the vest, and all require about ⅜ spring on each side. Now, when an undercoat is worn over that vest and anything that is under it at the neck, it follows that the coat requires *at least* the same spring, and it must be produced as shown in the diagrams, and when we proceed further, and put on an overcoat over the undercoat, we must again make our provision for a spring at the side of the neck, particularly so when we know that the undercoat collar takes its full share of extra bulk at and around the neck.

The height or the top of back of the different garments must also be observed. While the top of a vest back is placed at three and three-fourths, the top of an undercoat back stands at three to three and a quarter, and the top of an overcoat back is at two and three-fourths to two and a half. The undercoat must cover the vest, say by at least half an inch, and the overcoat must cover the undercoat the same distance, and the nearer a garment comes to the neck the more spring is required at the side of the neck. No spring is required at the back of the neck, but at the side, and is put in by the aid of the shoulder seam, or by stretching the sides of the neck.

The foregoing descriptions correspond with the body, but they will amount to nothing if we destroy the relative balance of the front and bottom of the armhole. It is true all coats can be cut without that spring, by moving the fore part downward on the base until the two points meet; but by so doing all other points are

changed, and new points will form. And while it is true that the new position of the points and parts will fit the same, it is equally true that the balance of the armhole and sleeve will also be destroyed, at least it will become necessary to readjust them, when each garment will then have a balance of its own. The purpose herein intended is to harmonize coats and vests on one base, and simply make the changes for each garment according to the requirements of the body at each particular point, and in all cases maintain the angle of 135 deg. and the balance of the armhole.

By saying that the balance of the armhole must be retained, I do not mean that the overcoat armhole must be cut just like that of the undercoat; on the contrary, an overcoat requires an armhole that is cut deeper as well as more forward. Cutting the armhole deeper, or more forward, does not destroy its balance as long as the sleeve follows. My reason why the armhole of an overcoat must be cut deeper and more forward, and consequently larger, than what will be obtained by a scale say 2 in. larger than the undercoat, is this: The armhole of an undercoat is always larger than the arm itself, and the body of the undercoat is also cut larger than the body itself, even over the vest. Undercoats are made up the heaviest at and around the armhole, and if any padding or wadding is put in, it is at the armholes and shoulders. All of which requires the overcoat armhole to be larger in proportion than the difference as obtained between the measure over the vest and over the undercoat. Besides, an overcoat to be comfortable must be looser in comparison with the undercoat—not only in the arms, but over the hips and seat. We may cut our armholes as large as we please, but if the coat has not enough cloth over the hips and seat the front of the armhole will be drawn backward, and it will strike the arm and cut it; and behind and below the arm, the back will appear too long and too wide, all of which will correct itself, if more width is given over the hips and seat. After all other parts are properly balanced, the overcoat armhole ought to be from $\frac{1}{4}$ to $\frac{3}{8}$ deeper and more forward than that given by the scale for the undercoat.

In this connection I will repeat, that for the undercoat the normal form may have the armhole 2 seams back of the angle of 45 deg., and at the bottom the armhole may be from $\frac{3}{8}$ to 1 in. above lines 9 and $11\frac{1}{4}$. The overcoat requires about $\frac{1}{2}$ inch more, forward and downward, and in all cases the sleeve must follow by striking a line for the sleeve base 2 seams in front of the armhole, without disturbing the center of the back sleeve seam at 8.

All this must be observed in cutting any under or overcoat, because as soon as the armhole is cut forward the sleeve must follow in width, which must be started at the highest point of the top sleeve, and allowing all around in front. All calculations backward as to the center of the sleeve behind must be made from the same point for all, and which point is a right angle from the center of the back through the point of the angle of 135 deg.,—for all of which further explanation will be found in the Article on "Armhole and Sleeves."

To recapitulate: A three-seamed overcoat can be cut over a three-seamed under sack, and two sizes larger, by the following changes: Top of back $\frac{1}{2}$ higher; back $\frac{1}{2}$ shorter, over the blade; armhole $\frac{1}{4}$ more forward and $\frac{1}{2}$ lower; $\frac{1}{2}$ allowance at the front sleeve seam to follow the armhole; $\frac{1}{4}$ to $\frac{3}{8}$ more spring toward the neck in the shoulder seam. At the center of back 1 inch more spring over the seat, and 1 inch more spring over the seat in the side seam, which must be started pretty well up, so that the hollow of waist receives about $\frac{1}{2}$ inch.

In Dia. X the front of the neck is placed at 4, resting on the front line of the angle of 135 deg., which is as low and as far forward as it ought to be made for a short roll. Overcoats which are intended to button clear up, should have that point $\frac{1}{2}$ higher and $\frac{1}{2}$ backward, and the same may be said for the long roll. A long roll requires a smaller lapel, but a larger gore. Reducing the top of the front by a gore under the lapel will make a far better front than if the top of the front edge is shaved off that much, because it produces an oval shape to the breast, and takes up the surplus cloth in the center of the front—and more so on an overcoat where the front may lap the distance of 3 inches.

To produce a three-seamed over sack for a larger or fuller waist, allow say 1 in. more at line 20 and at the side seam, starting somewhere below lines 9 and $13\frac{1}{2}$ and above line 15; but this allowance should not be more at the bottom than at the seat. It is not required, however, behind, or in the side seam, but more forward, and in order to throw that allowance of an inch forward to the side of the waist, the side seam of the forepart must be stretched perhaps $\frac{3}{4}$ of an inch at the hollow of the waist and above, because stretching below the waist would do no good, as the width must be thrown to the waist and hip. A three-seamed over sack can be very much improved by judicious stretching, as well as by shrinking, for the reason that the forepart is a very large sheet, and if made up flat will never fit the outlines of a man. At least, if all parts are first properly stretched or shrunk a better result can be obtained than if made up flat. For instance, the front edge will never lap over the center of the body 3 or 4 in., and button smoothly, if it be not drawn in at least 1 in. all the way across the chest, unless the

surplus length is drawn upward and balanced by a gore under the lapel. Now, although a three-seamed oversack *can* be made, I know that a five-seamed one can be made better. Cutters and tailors may try ever so long to bring a three-seamed overcoat correctly to the body without stretching or shrinking some parts, but they will never succeed as well as with a five-seamed one, and I refer you to Dia. X.

It must be admitted that a great deal of the spread of the body is sidewise over the hips, or say in the middle of the forepart. On a three-seamed garment, this must be put on either in front or at the side seam, but on a five-seamed one this can be put just where it belongs, by enlarging the square and cutting the surplus width out again under the arm as the fifth seam. By so doing, the lap of the forepart and back over the seat of a three-seamed garment is thrown sidewise, and the back and sidepiece of the five-seamed one just meet at the largest part of the seat. All other points are the same in either the three or the five-seamed garment, except the length of back above the armscye, which must be shortened $\frac{1}{2}$ inch on a five-seamer, and the side seam stretched $\frac{1}{2}$ upward, which stretching upward will re-balance the length of back again over the shoulder blades.

The height of back, from line 9 upward, should be a trifle shorter on all overcoats than on undercoats. All overcoats should be cut so that they lean more toward the erect form, and also toward a large-waisted form. It is a fact, which should be well understood by cutters, that a good-fitting overcoat for the normal form will fit well, as an undercoat for the large-waisted form, because a large waist requires a shorter back, and again, the waist of an overcoat cannot be cut according to a waist measure with the tape drawn tightly over the undercoat, and as closely as the body will allow it to be drawn together, but the waist measure must be taken over the undercoat, as loosely as it hangs on the body, and this represents a large waist. If an overcoat be buttoned up, it must just pass around the undercoat as it hangs loose at the waist, and as soon as the overcoat is compelled to draw the undercoat together at the waist, it will be too tight for the purpose.

Dia. X is intended for a loose coat, and if a close fit be desired, the measure must be taken very close, and for such, a loose measure over the vest may be used, and in no case should a reduction be made in one place unless for an abnormal form. Dia. X is purposely made large, but it will hang well on three or four different sizes, or on anybody who can put it on, and is not of the odd forms. Furthermore, it will produce an overcoat which goes on, or comes off almost by itself, and which will not require the whole household to help to pull it on or off.

Dia. Xa is intended for a closer fit, but I will here warn trying to make overcoats fit very closely, for more are spoiled in the attempt than are made better. It is without gore under the roll, and may be used for a soft roll, either long or short. Being without gore under the lapel requires the coat drawn in pretty well over the front. It may be cut with a gore, by which surplus cloth may be drawn upward from the center of front, providing the amount used up for the gore is again allowed in front.

I will again repeat that Dia. X is for an erect form, and will cut a large but good-hanging coat. If this diagram be used for a more forward-leaning form, the spring in the center of the back may be reduced to $1\frac{1}{4}$ at line 30, starting at line $17\frac{1}{2}$. All overcoats are the better off by having plenty spring over the seat, and if there be too much spring, it is easy to sew it in. Dia. Xa will be found to represent an overcoat for a more forward-leaning form, but not for the stooping form. The neck is cut pretty well upward, and besides the three-eighths spring at the shoulder seam, the side of the neck must be stretched at least $\frac{3}{8}$ to $\frac{1}{2}$ inch on each side, or else the collar will be too tight. Stretching the side of the neck, as directed in this work, requires that the shoulders at and around the side of the neck must be made up thin, and that all canvas and all padding must be cut away gradually, so that the facing can be stretched also. Holding the collar full, and without stretching the neck, or working the shoulders according to the shape of the body, may result in a fit, but one coatmaker may put life in that fit, while another makes the fit dead, or flat, or stale, or whatever it may be called.

Now a word about the bottom of the back. It may look odd to some cutters to see the bottom of the back shorter behind than at the side; but the whole bottom of Dia. X may be considered correct for the normal form, and it is the same in Dia. H. The shortness behind of any back is caused by the back being laid out in such a position that nothing is hollowed out at the waist behind, but a spring thrown outside of the center over the seat. The backs are laid out in such a position, because the armhole and the sleeve can not be connected, as they are, on either Dia. VII or X, in any other way. But though, most all Fashion Reports have the backs hollowed out behind, and at the hollow of the waist; still I claim that it is a natural way, to lay out the upper parts of the

backs on straight lines. When we observe the run of the center of the back, and when a coat fits the body well, we find that it runs down straight from the shoulder blade, to the hollow of the waist, no matter on what lines, or bases such backs are cut, but below the hollow of the waist, the back comes in contact with the seat and must be sprung out gradually.

To run a line for the center of the back inside of the square, can be done with the same result, but all other points must change, and it would show that the draft does not conform to the natural run of the body, which is flat behind and on straight lines. Now, right here, it might be observed by some that the seat and the shoulder blades are on about the same line, and which line may be called a plumb line, and that the back should be hollow at the waist and not come outside of that plumb line. If we observe the Fashion Reports we come to the conclusion that all diagrams are based upon that idea, and for more than twenty years I have labored under the same delusion. If I claim that the back of a coat runs straight down behind, I do not mean it to run straight down over the seat, like a shirt, but to run straight down from the shoulder blades to the hollow of the waist, which is about 15 deg. from a plumb line. Consequently the back of the seat is outside of that line, and the natural run of the coat back is outside of that base, but may be divided between the center of the back and the sidepiece of a frock coat, and also partly between the center of the back and the side of the back on a sack.

It is true that in Fig. II the plumb line as a base for the angle of 15 deg. is outside the body of the seat, but when the coat is on the body, the gores which are cut sidewise cause the back to be turned about 15 deg., running along with the body from the shoulder blades to the hollow of the waist, which is well illustrated in Dia. I.

FIGURES

AND

DIAGRAMS.

FIGURES AND DIAGRAMS.

FIG. AND DIA. I.

THIS figure shows the front and the back views of the normal form, as adopted in this work. It illustrates the slopes of the shoulders, and the measurement of said slopes on the angle of 135 deg., and each separate shoulder slope on an angle of 22½ deg. from the side of the neck. It also illustrates the pants bases, on the angle of 7½ deg., and shows the reason why the top of the front of a pant's waist is thrown forward of the front base line. It shows the front pants base ⅝ sidewise of the center of the body, and runs down parallel to the inside of each leg. This figure is calculated to be in such a standing position that the ankles are 1¼ inches apart, so that ½ of that distance is ⅝ of an inch to the center, hence the ⅝ to be thrown forward of the base, on top of waist, as the smallest amount for any form.

In front of the center of the figure will be seen another dotted line, which is marked 1¼ from the base, which is intended to show the front of a pants for a fuller waist, or for a more forward leaning waist. This addition may be the most that can be allowed for a forward-leaning waist, and may also be considered to be the most that can be allowed for a medium large waist, as to such forms which require a made up waist of 40 inches, but whose seat measure is only 40 inches. Forms which measure 42 seat and require a waist of 41 made up, may have 1½ allowed in front of the base, and a 46 seat which requires a waist 50 inches made up, may be given 2 numbers, as shown in Dia. XX, but 2 numbers may be considered the most which any pants will require.

The position of the front pants base, on the front line of the angle of 7½ deg., must be considered, as it will be, when the pants are on the body, that is, running parallel to the front of the leg, which is forward on top of the waist, and which slope may again be called 7½ deg. From this line, most of the normal forms carry the top and front of waists a trifle backward, but it is very little, and we will call such waists even on that line, in order to make a standard.

Now, it must not be supposed, that when a waist grows larger in proportion, that it grows, or spreads very much forward of that line. Whenever the waist grows larger, the body becomes more erect, in order to keep in balance, and the relation between the front of such a waist, and the line running parallel to the front of the leg, change very little, and Dia. XX may be considered to be large enough at that point for almost any form. On the other hand, we find large-waisted forms which do not carry their fronts of waists in front of that line at all, though their abdomen may curve outside of it. Such pants may be cut with a normal front of waist—but with a trifle more curve over the center of the abdomen, and plenty full at the side so that the forepart is thrown forward from the side, forming another curve over the oval front on the same principle, as the back is thrown backward from the side, to form the curve over the seat.

There is an endless variation of such forms, and it is fortunate for cutters that a trifle more or less will not kill a pants. The difference in Dia. XIX, XX and XXI is not so great that a great mistake would be made. All the small diagrams were made with the top of front of waist thrown forward of the base 1¼, but as they are used for illustration only, and as there are a great many pants which require it, they have been left that way. Otherwise they are the same as Dia. XIX, XX and XXI.

FIG. II.

Fig. II illustrates the side view of the angle of 135 deg. as applied on the draft, and shows the reduction of the square in front and below the waist, as well as the addition behind and below the waist. The diagram on this figure is a simple vest, on the square of 17½, and hence the under arm cut is 3¼ at the circle.

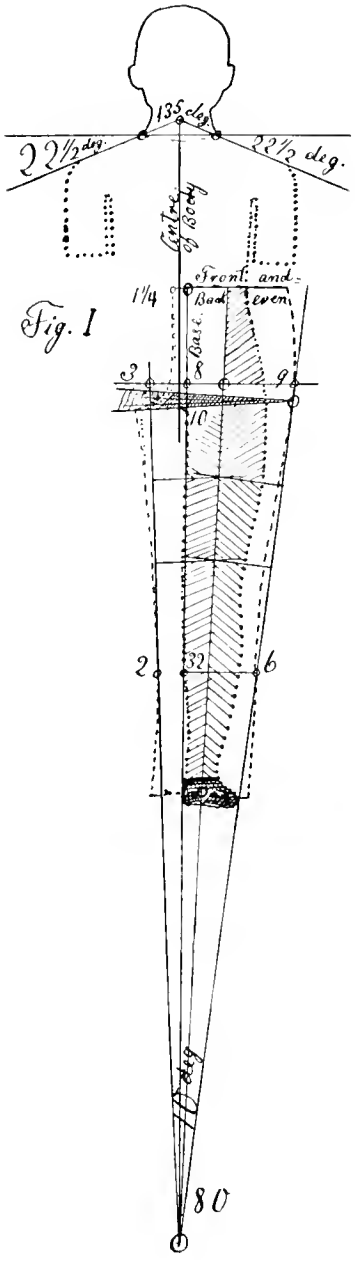


Fig. 1

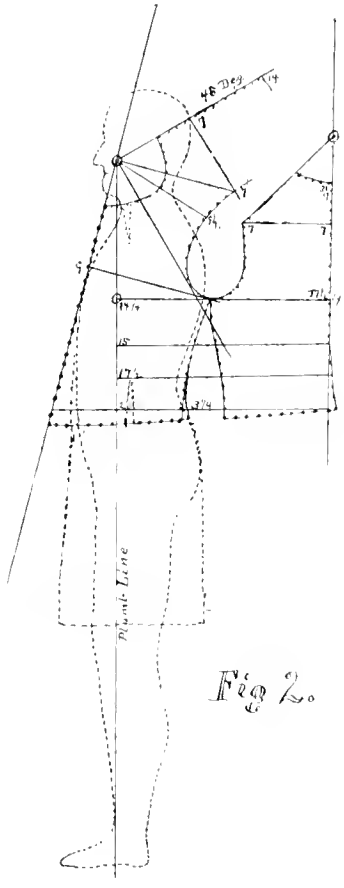


Fig 2.

(Copyright)

DIA. I.

Dia. I is intended for illustration only. It is on a square of 20½, and the ½ is intended for the extra seam which the frock coat requires. The center of the back and center of the front run in the same direction as they must run when on the body. It also illustrates the spring over the hips as the body actually requires it.

The gore between the side-piece and back illustrates what may be buckled up on a vest. The front represents a straight single-breasted coat, as worn by the military or clergy, and may be depended upon if placed as in Dia. II. The front of such a coat must have a large gore in the center, which gore must be made at least 1¼ to 1½ inches, seams included, and must start well up above line 15, and the edges cut oval, not hollow; and the canvas and all padding and lining must be cut and worked in the same way, in which case the front requires no drawing in. The stay is put on close merely to keep the edge from stretching.

Above line fifteen the button-holes are cut, and the buttons are set plumb on the front line, but below line 15 the button line turns backward as shown. To meet the collar in front, nick one seam back of the front line, for military, but for a clergyman's coat place the nick ¼ back of said line. The top of the skirt laps 1 inch in front of the forepart, and drops ½ inch on the bottom of the front. The standing collar must be a straight piece, and its width depends upon regulation. For a clergyman's coat the standing collar should not be less than ¾ inches nor more than 1 inch, made up. The front of such a collar may be run straight upward with a line parallel to the front line of 135 deg., but may be shaved backward on top according to regulation or taste.

The place for the shoulder straps on military or society coats is the spot between the lines represented by 60 deg. from the front and 60 deg. from the back, which space of 7½ deg. represents the top of the shoulder. For practical purposes, use the back part of Dia. II for such a coat, and shape the front like Dia. I.

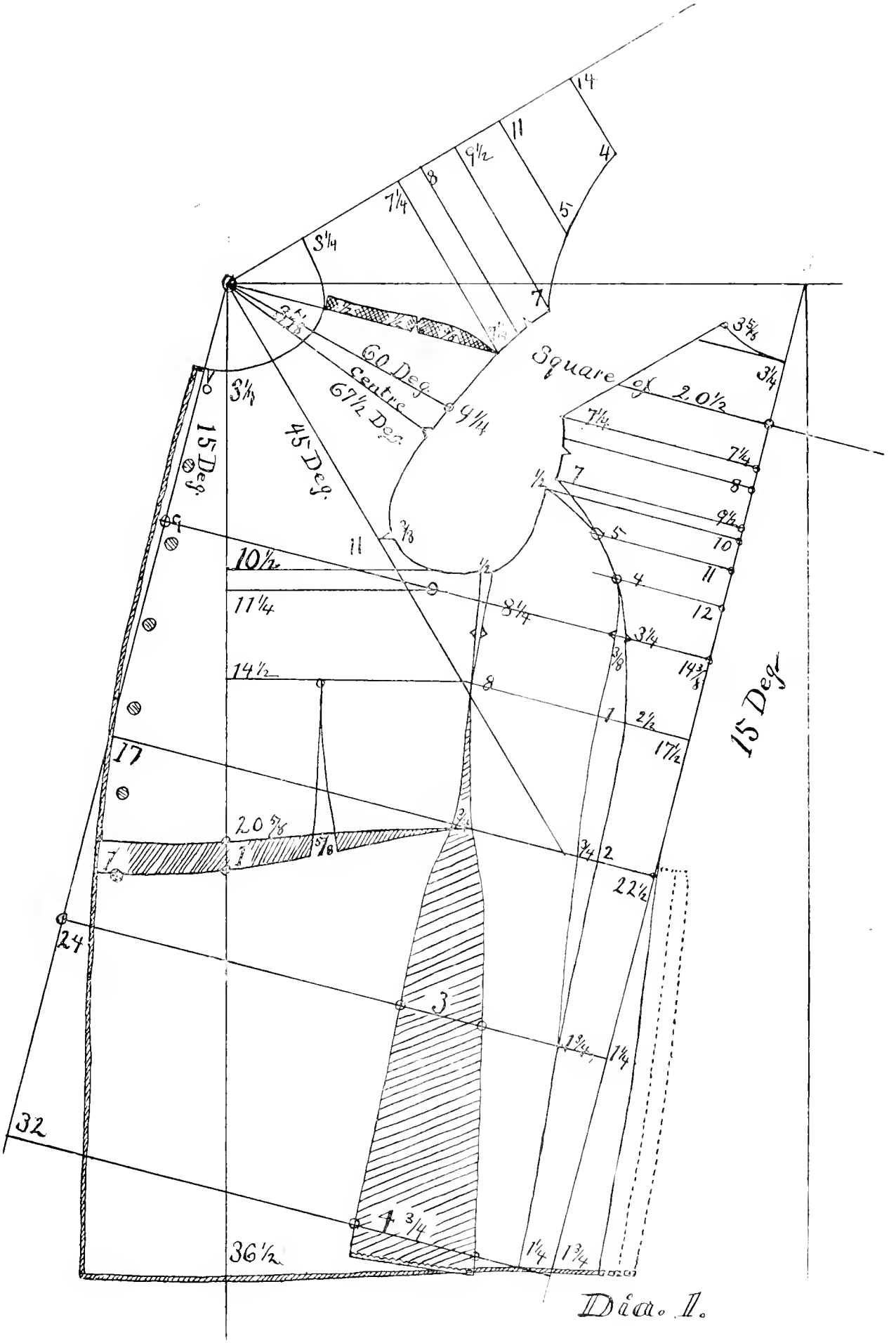
This Dia. I is made to show all the angles which start from the point of 135 deg., and which are required for a coat or vest. That angle which forms the shoulder seam, and which is also marked square of 20½, is 45 deg. from the center of back, but for some reason it was forgotten to be so marked. The lines of this diagram may be used to draw the angles for any coat or vest, by simply making them long enough for the size required, the same as in Dia. XII-A. Drawn long enough to cover both shoulders, as shown in Fig. I, the outside lines of this angle of 135 deg. is to be used to measure the shoulders as well as to draw all the other lines, or angles for drafting.

A circle drawn from this point, with a half diameter of 8 inches, will be large enough, and it may be cut out of solid paste-board, but better, of tin or zinc on which the lines are correctly drawn. The location of the forepart and shoulders is the same as in Dia. II, or any other diagram. The back and the sidepiece on the square of 20½ are in a different position only. The front is just as good as any diagram can be made for a military or for a clergyman's coat, when placed as in Dia. II. The back and the sidepiece is for illustration only.

That back which rests on the angle of 135 deg. is in all respects correct, but the back which rests on the sidepiece has *one* incorrect line, and this is the line forming the shoulder seam. It is correct at the armhole, but should run up to the point of the square of 20½, so that all three lines meet, and it will be found that from that point, down to line 9 over the front, will be 14⅝, but line 9 itself gives the correct distance from the top and back corner of the square.

By close observation it is also seen that the height of back above line 9 is only ⅛ more in Dia. I than it is in Dia. IV, or on the vest, and also that the side of the back of Dia. I is reduced again in length ½ inch by a gore from the armhole to the shoulder blade, all of which proves that both coat and vest are the same thing on the same square, and that the heights of back and front are the same, and in order that the vest is covered by the coat, the neckhole for the vest is cut ½ lower.

If everything is considered at the waist, the coat is only a trifle larger than the vest, and that, what the front of a coat has more than a vest, is used for the lapel. Though Dia. I has a square of 20½, and Dia. IV has only a square of 20, both have the same width when all the seams are sewed up. All of which shows that, as the coat must pass over the vest, the vest must be cut at least one size smaller than the coat, and I have found it correct. In other words: The difference between the breast measure over the vest, and that under the vest, is about 1 inch in the whole breast measure. Dia. I gives a good deal of information, though it may be useless for practical cutting.


14
11
9½
8
7¼
5
4
3¼
7
60 Deg.
Centre
67½ Deg.
9¼
Square of 20½
3⅝
3¼
7¼
7¼
7
8
9½
5
10
11
4
12
3¼
3⅜
14⅜
2½
17½
15 Deg.
15 Deg.
45 Deg.
10½
11¼
14½
17
20⅝
⅝
22½
24
3
1¾
1¼
32
36½
1¼
1¾
Dia. 1.

DIA. II.

This is a plain double breasted frock; and the diagram is plain and requires little extra description, except the front of the waist and lapel. The fore-part has no gore at the waist, and the reduction is made in front. It will be seen that the double-breasted front of Dia. II is only about 1 inch wider than the single-breasted front of Dia I, and that the gore in Dia. I is balanced in Dia. II by the large gore between the lapel and fore-part upward, and if it is desired to cut a small gore at the waist, then all what that gore takes up must be allowed in front.

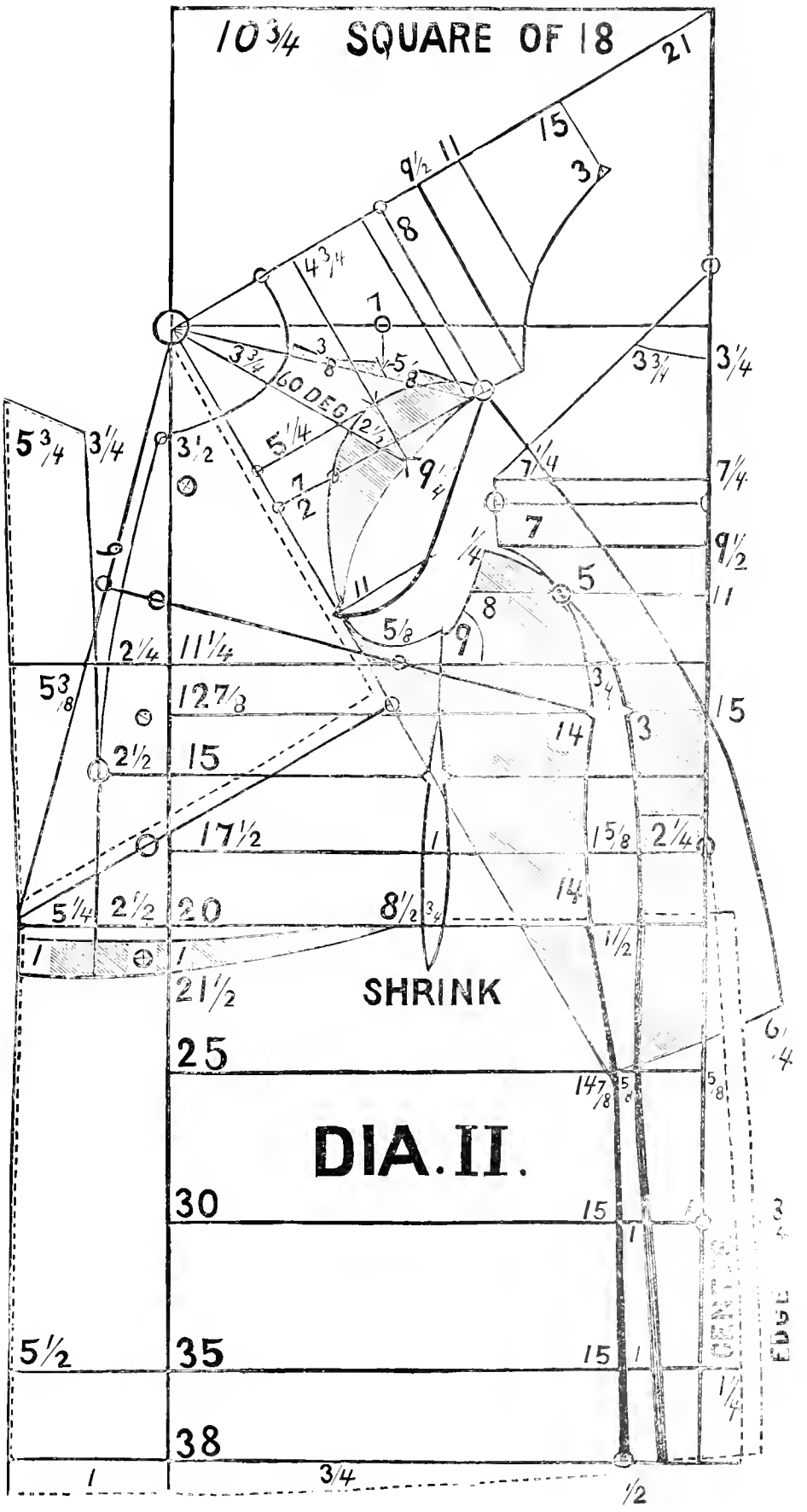
The lapel in Dia. II will roll anywhere down to the second or third button, but if a gore is cut at the waist the roll will go down to the waist seam; and if the collar is pretty well rounded in front the lapel may be run down to the bottom. All frock coats have the center of the back pretty well thrown out at the bottom of the skirt, and this extra width is again reduced between the back and front skirt, which operation allows that seam to be oval-shaped in order to fit over the seat. The frock coat, being open behind, must receive its oval form over the seat in the seam between the back and front skirt, because that seam is sewed together and will hold its shape, whereas if the roundness were placed in the center behind it would simply produce a curved edge, but not an oval shape for the seat. The lap between the forepart and the skirt represents the extra length over the oval chest, and for a full chest, and if the chest is not very full, the lap of 1 number may be reduced to $\frac{1}{2}$ at the front edge, but must remain 1 number at the plumb line base.

Dia. II is intended for the normal form, and for the following measure; Breast, 35; waist, 32; hip, 34; seat, 36; length of legs, 32 to 33; form straight without being over-erect. The back and the sidepiece is intended for a close fit, or as fine work ought to fit. If a looser fit is required, the gores between the back and the sidepiece and between the fore-part and the sidepiece should be made a trifle smaller from the hollow of the armhole downward, which will give greater ease to the armhole and is better than to cut the armhole more forward. If a waist is prominent, say nearly as large as the breast, the underarm gore may be made as small as $\frac{1}{2}$ to $\frac{1}{4}$ at line $17\frac{1}{2}$ and run out to nothing at line 20; while a very large waist may require a lap of 1 inch, at the waist seam, starting said extra width at the bottom of the armhole.

This diagram shows the sleeve and the armhole different than Dia. VII. The armhole is cut out to the front sleeve base line and the sleeve and the armhole laps $2\frac{1}{2}$ at 60 deg., all of which gives both armhole and sleeve a trifle larger and that armhole requires not so much stretching as that of Dia. VII. The top sleeve and armhole nicks are connected by a right angle from the center of back through the angle of 60 deg, and they will fit pretty close together, and in fact may be taken together on all sleeves and armholes, basting forward and backward to meet the other nicks.

NOTE: Elsewhere it is stated, that Dia. II must be considered the parent pattern of all others, which is quite true, though the armhole of Dia II is larger than the others.

FURTHER: In cutting the gore between the back and sidepiece, point 5 must be quite slightly touched by both, and it may be better to have $\frac{1}{8}$ gore there on all coats except for the stooping form. See Dia. II B.


10 3/4 SQUARE OF 18
21
15
3
9 1/2
11
8
4 3/4
7
3 3/4
3/8
5/8
60 DEG
2 1/2
3 3/4
3/4
5 3/4
3 1/4
3 1/2
5 1/4
7
2
9 1/4
1/4
7 1/4
7/4
7
9 1/2
11
5
8
9
5/8
2 1/4
11 1/4
5 3/8
12 7/8
3/4
14
3
15
2 1/2
15
17 1/2
1
15/8
2 1/4
5 1/4
2 1/2
20
8 1/2
3/4
14
1/2
1
1
21 1/2
SHRINK
25
14 7/8
5/8
5/8
DIA. II.
30
15
1
5 1/2
35
15
1
1/4
38
1
3/4
1/2

DIA. III.

This diagram is also made for illustration only, for it would be too complicated for practical cutting. It is made for the purpose of showing the correct position of the back and sidepiece for cutting a sack coat without changing any balance in the armhole. The sidepiece is so placed that it will form a spring at the side of the hip, and the back and sidepieces are lapped over on top enough to balance one seam, leaving the sack as a three seamed garment.

The top of the back skirt and bottom of the sidepiece lap over, and which lap represents the extra length that the frock coat requires while passing closer to the hollow of the body. On the sack coat the spring over the hips is not used, nor is the larger frock coat gore behind, but between the two the sack seam is cut with a gore of about $1\frac{1}{2}$ numbers at the hollow of the waist.

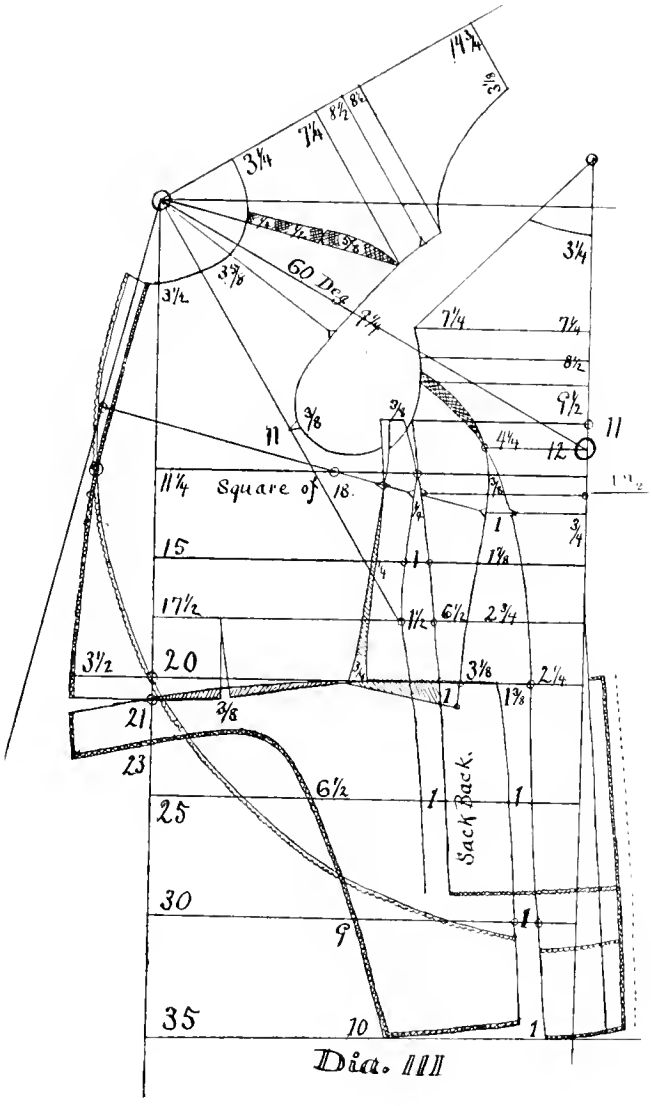
In placing the sidepiece in position, as in Dia III, the back part of the sidepiece on the shoulder blade falls backward and enlarges the square $\frac{1}{2}$, and for this reason the three-seamed sack coat has a square of 18, or the same as a five-seamed frock.

In turning the sidepiece down into the waist, the top of the sidepiece will fall down behind and form the spring between it and the skirt, and consequently the whole frock coat back shortens on top, or from line 9 upward; and for the further reason that the sack coat back is the wider, the height of a sack back appears still shorter, as seen in Dia. III and VIII, and is $13\frac{1}{2}$. For further explanation as to why the back of a sack is shorter than that of a frock, see article on "Narrow and Broad Backs."

All foreparts in Dia. I, II and III are in the same position, and all changes are made on the sidepieces and backs. Dia. III produces the closer-fitting skirt for a cut-a-way. All skirts are alike over the back, because all coats must fit the same over that portion of the body, but fronts of cut-a-ways must be closer than those of double-breasted straight coats. The lap of the top of the front of the skirt and bottom of the front of the forepart are reduced from the sidepiece forward, which takes away all surplus flow of the skirt. The gore in the fore-part is simply turned forward on a cut-a-way, while on a "Prince Albert" it stops at the waist seam.

The swing of the sidepiece in Dia. III is made at line 9 over the forepart and on the square of $20\frac{1}{2}$. The break is made there, and the calculation is made from that point; and it is for this reason that an opening is made above line 9, which is about $\frac{3}{8}$ at the height of the sack coat side seam, and is cut away on a frock coat, as a small gore, if the garment is cut in this position. But in a three-seamed sack coat the swing must be considered further back, or at the seam, consequently the opening is at the top of the sack coat side seam, which is cut out as a small gore between back and front and above line $11\frac{1}{4}$, or else the back armhole will be too wide, and show too much sleeve there. This gore may be made $\frac{1}{4}$ to $\frac{3}{8}$ of a number, but which is obliterated when the sidepiece is turned so as to come in the position as shown in Dia VIII-a.

After the cut for Dia. III had been made, I came to the conclusion that the opening of the frock coat sidepiece and forepart toward the armhole, could just as well be balanced in a sack, by cutting it as a five-seamer, and by making back and forepart even above line $11\frac{1}{4}$, and this was one reason why Dia. VIII B was added.


14¾
3/8
8½
8½
7¼
3¼
3/8
60 Deg.
3¼
3½
3¼
7¼
7¼
8½
9½
11
3/8
3/8
11
4¼
12
11¼ Square of 18.
15
17½
3½
20
21
23
25
30
35
3/8
1
1
1

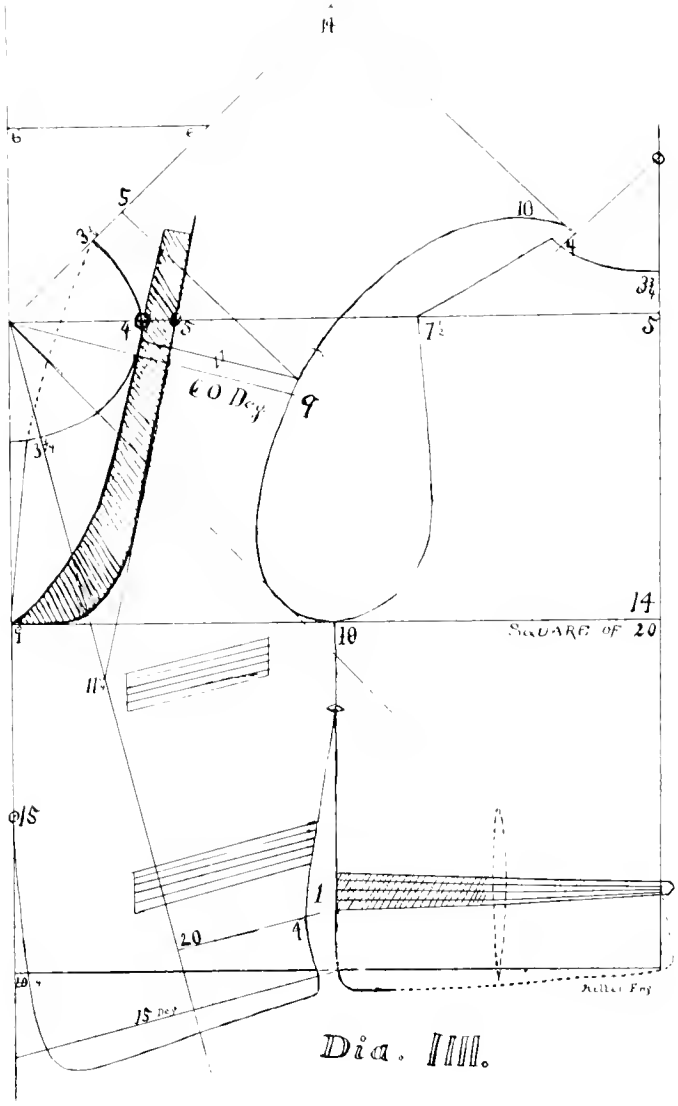
DIA. IV.

Dia. IV represents a vest, and is quite plain. It is on a square of 20, and in the same position as shown in Dia. I, front and back bases running parallel. From the front of the waist, or at the pit of the stomach, or where the body turns, the square of 20 is reduced to conform to the bend of the body, and from the back of the waist, or where the body turns, the back receiving what the front has lost.

Under the arm the normal form requires a reduction at the waist of about 1 in., and another in the middle of the back, as shown in Dia. I, between the sidepiece and back, but which may partly be taken off at the side seam and partly buckled up. A vest without buckle-straps should be cut with a gore in the back of say $\frac{1}{2}$ inch, and as shown by dots in Dia. IV and XIII. All vests should be cut as though there were to be no turn-down collar, and if such a collar is to be added, a simple piece of the shape of the whole neck is attached, in which shape the front may be curved at pleasure.

The side of the neck as 4, is for a vest without a turn-down collar, and is calculated to lose one seam for the turn-in; and if the vest be bound this point ought to be $4\frac{1}{4}$, and if a turn-down collar is put on, said point should be fully $4\frac{1}{4}$, because nothing is lost by a seam, but instead there is an actual gain by the top-collar covering the seam, and for the purpose of illustrating Dia. V, VI, IX, Dia. IV has the shoulder seam cut on a straight line, and without lap or gore, and if cut just like it, the side of the neck must be stretched say about $\frac{1}{4}$ to $\frac{3}{8}$ inches on each side, and close to the shoulder seam. If, however, the vestmaker can not be trusted to do the stretching right, it is better to allow about $\frac{1}{4}$ spring at the neck, starting at, or about the middle of the shoulder seam, or to cut the vest as directed at the end of the article on vests. In no case must the back be held full on the collar.

When finishing the neck, the side of the back is to be turned in, or cut off, whatever surplus length may be there, but the center of the back is turned in just one seam. Notch the shoulder seam as shown and baste up and down.



Dia. IIII.

(Copyright.)

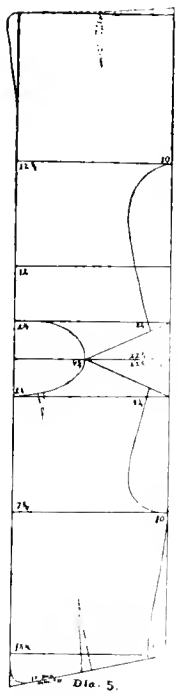
DIA. V.

This diagram is also given for illustration only. It represents the centers of the front and back on straight lines, the neck-hole on the back and front, even, and the reduction of the shoulders at 45 deg., as it actually is to be reduced. The side of the neck represents Dia. IV as cut out $4\frac{3}{4}$, and would require a standing collar of $\frac{3}{4}$ to be sewed on. In this position a neck-band could not be cut on the forepart as shown in Dia. IV, because the shoulder seam would be too far in front. Though it is useless for actual cutting, it is worth its place in this work for illustration. It fully demonstrates that the so-called front shoulder point is a myth.

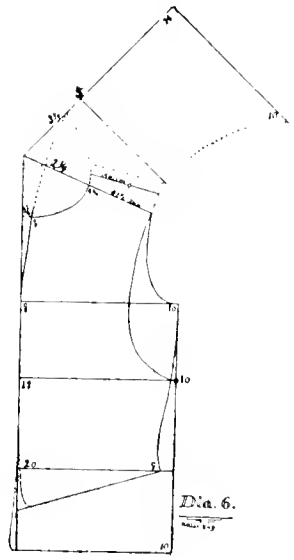
DIA. VI.

Dia. VI is also for illustration, and shows the vest on the angle of 135 deg., and again on an angle of $\frac{1}{2}$ of 135 deg., or on $67\frac{1}{2}$ deg. There the angle of 135 deg. is cut in two, or folded together, so that the center of the front and center of the back are one line, and wherever the front of the waist is reduced the back is enlarged.

The cut of the side of the neck is the same as shown in Dia. V, though one is shown as 3 2-4 and the other as $4\frac{3}{8}$, but the calculations are made from different points. Dia. IV is the parent pattern of Dia. V and VI.



Dia. 5.



Dia. 6.

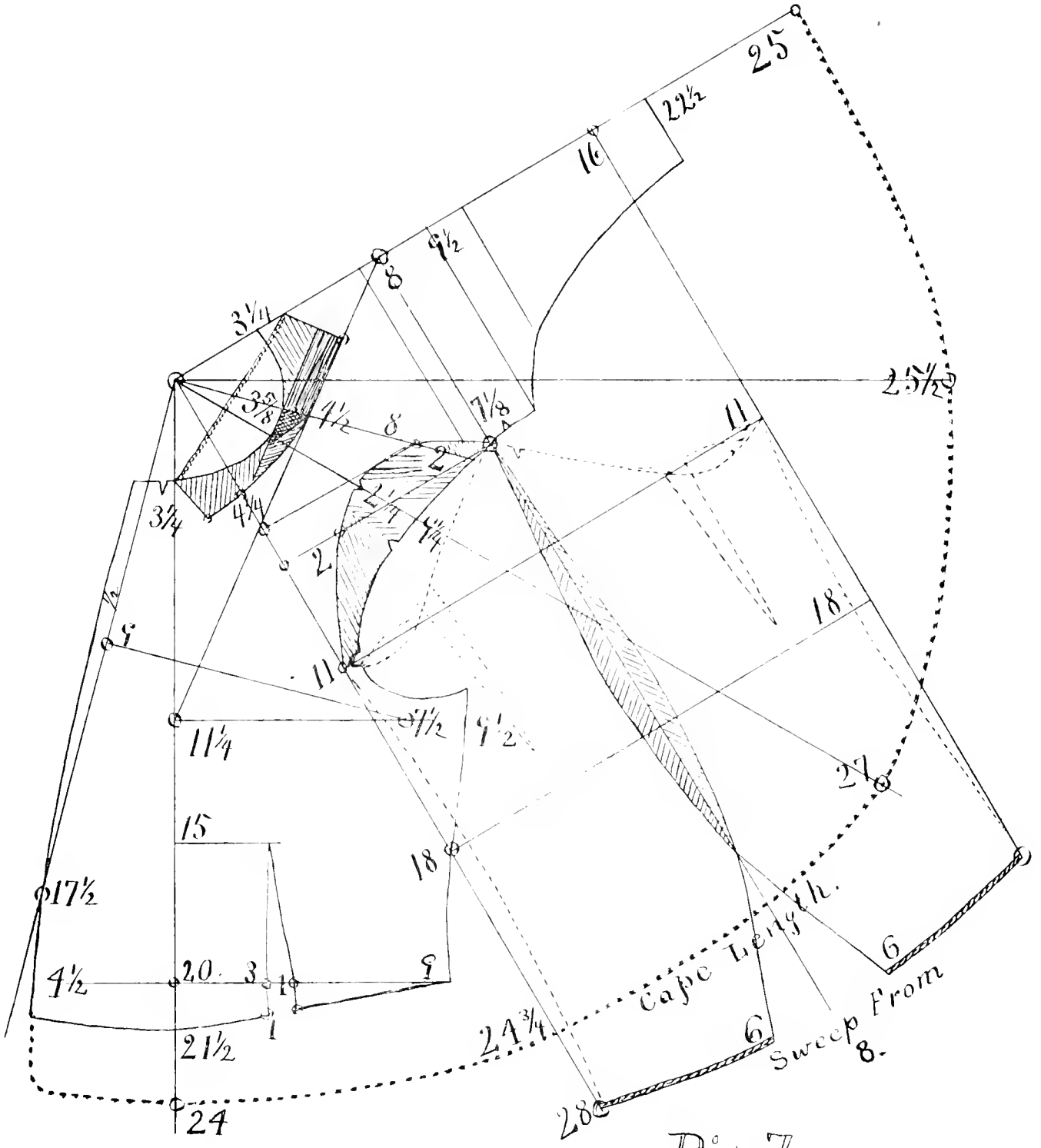
(Copyright.)

DIA. VII.

This diagram represents the sleeve system. On the top square line from the front base, or at 45 deg. from the back, the sleeve and the shoulder should lap about 2, or as much as possible to form a nice curve toward the front seam. A short top sleeve on the angles of 45 and 60 deg. will draw both the front and the back seams out of shape. A top sleeve is better too long at these points than too short, because the top sleeve can easily be reduced, but if that lap is too short, the back and the front seams will be drawn upward, and will be too long at the armhole, while at the hand the sleeve is that much too short. Whenever the under sleeve appears too long on either seam, it shows that the top sleeve is too short. At 60 deg. the diagram shows $2\frac{1}{4}$, which may be taken as the smallest portion to be given there, and may be made $2\frac{1}{2}$. (See Dia. II.) The armhole and sleeve should lap 1 to 2 seams on the front sleeve base, and if the armhole is cut larger than the diagram, the sleeve must follow, which, of course, must change the lap at 60 deg.

The armhole, as it is shown in Dia. VII, is for a close-fitting armhole, but there is no law to prevent it from being cut further forward and downward, providing the sleeve follows. (See description of sleeve as shown in Dia. X.)

NOTE: Dia. II, II A and VIII B were made one year later and show the top connections of sleeve and armhole in a different way, and they also show the armhole larger all around. Stooping forms with prominent shoulder blades require their armholes still further forward, but I have never found a stooping form who required his armholes more than $\frac{5}{8}$ in front of 45 deg., and such forms should have the back that much wider. The armhole $\frac{5}{8}$ back of 45 deg. for the arms thrown back and $\frac{5}{8}$ in front of 45 deg. for the arms thrown forward may be considered the limit for both extremes.



Dia. 7.

(Copyright.)

DIA. VIII.

Is a sack with three seams and with a straight front. As long as a cutter is able to cut a straight front, he will have little trouble to cut any shape of a cutaway for either sack or frock. As shown in the diagram, the height of the back above line 9 over the front is placed at $13\frac{1}{2}$, the same as in Dia. III. This height of back will make the back plenty short for the normal form, and it may be called rather short, but any coat back is better $\frac{1}{4}$ inch too short than $\frac{1}{4}$ inch too long, for if short, it can easily be stretched at the center and over the shoulder blade, and such stretching, if done properly, will improve all such sack coats, because the center of the back as far over to the shoulder blade of any person are always longer than the sides.

On a frock coat, the shortness at the sides is reduced by a small gore between the top of sidepiece and the back, because of the curved seam, but on the more straight sack seam, said reduction can not so well be made, except by cutting the back shorter, and stretching it again behind, at, and as far over as the shoulder blade.

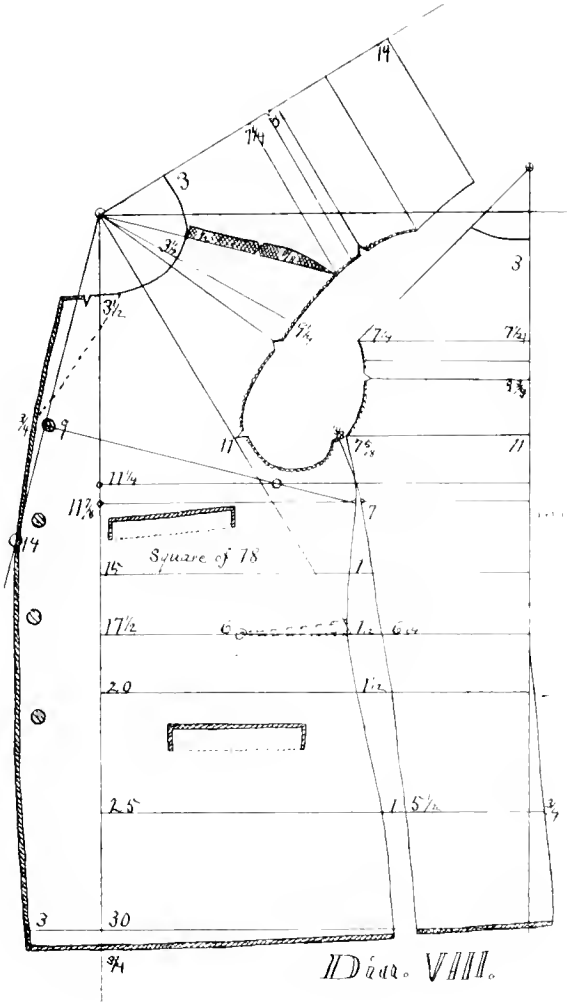
For a double-breasted front, add 1 inch to the front of Dia. VIII cut a gore under the lapel, and add to the top and front of the lapel, whatever that gore takes up. Set the buttons back accordingly.

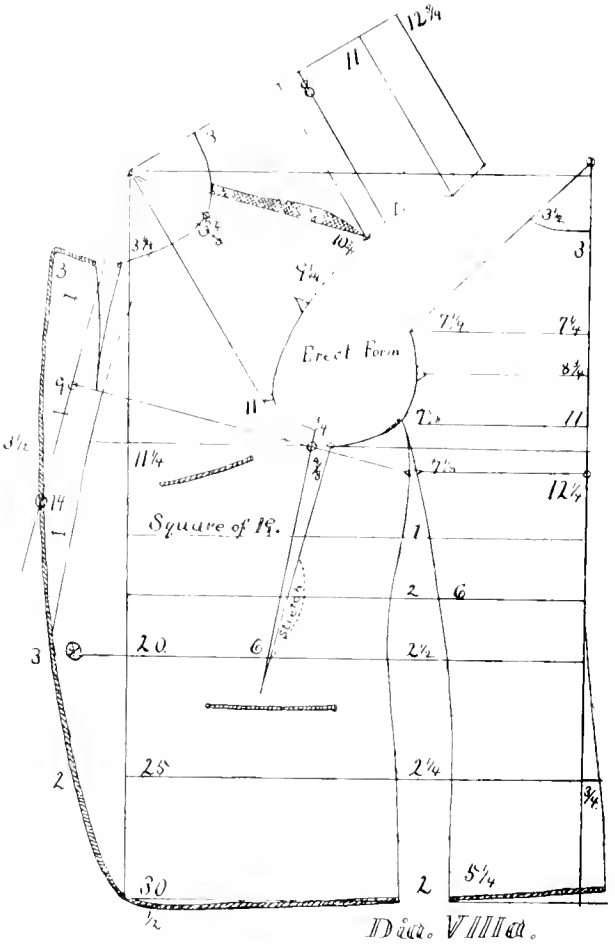
Dia. VIII is made for the same form as is Dia. II, that is for a slender form and small waist, and if the waist is to be more full, or the armholes are to be quite loose for working coats, reduce the gore between the fore part and back one half inch clear down, starting at line $11\frac{1}{4}$. The armhole is represented close-fitting, requiring it to be well stretched, but it may be cut forward to the base and in every respect made like Dia. II. The same may be done to Dia. VIIIa.

DIA. VIII a.

This diagram is made especially for the erect form, but may be used for the normal form by placing the depth of back at $12\frac{3}{4}$ above line 9. As the diagram is, it simply gives the result of the closing of the $\frac{5}{8}$ fold, as shown across the waist in Dia. VIII. Erect forms usually require small coats in the back, and in the armhole, and for this reason, such forms should be cut one size smaller than the measure, and $\frac{1}{2}$ inch should be allowed in front, to balance the size.

The front is given with a pretty large roll and the upper part may be used for a double-breasted sack, while meeting the front edge and the front angle in front of line 15 and by going forward 4 numbers at line 30. The gore between the back and sidepiece may be reduced to 2 at line 20 and to $1\frac{1}{2}$ at line 30. The height of the back, above line 9 is $1\frac{1}{4}$ number shorter than on Dia. VIII, and which is accounted for as follows: The fold across the waist which is obtained from above is $\frac{5}{8}$, and the side of the sidepiece is stretched upward $\frac{5}{8}$ on the forepart, all of which requires the back to be $1\frac{1}{4}$ shorter above line 9. If the sidepiece is stretched less, the back must be so much longer, and for a good many forms $\frac{1}{2}$ stretch may be plenty, in which case the height of back is to be $12\frac{1}{2}$.



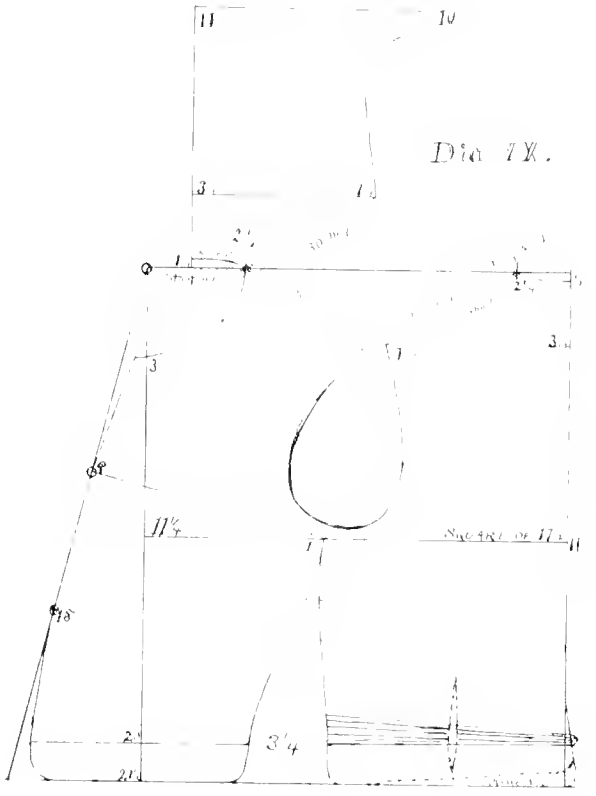


(Copyright.)

DIA. IX.

Dia IX is made to illustrate the changes of the shoulders from the normal to the long or short neck. For this purpose the shoulders on each back and front are made equally high, and the coat armhole connected evenly all around. This diagram being on the square of 17½ would require a coat to lap 2 seams somewhere. The diagram itself shows a vest on the angle of 15 deg. and in a square of 17½, with a gore under the arm of 3¼. But the main object of Dia. IX is to illustrate the height of the shoulders; and extra length or extra shortness of the shoulder must be produced as shown by dots, and is further explained in the articles on "Long Necks and Square Shoulders."

This diagram also shows a shoulder slope of 30 deg., for the reason that the base is on the front plumb line and not on the center of the front. The front plumb line is 15 deg. back of the center, hence from it each front and back shoulder slope is 7½ deg. out of its normal position. If the diagram were made on the square of 20, the armhole could not be connected all around, as it must be on the body. This diagram represents a complete armhole, after the under arm seam is sewed, and the coat is built around it.

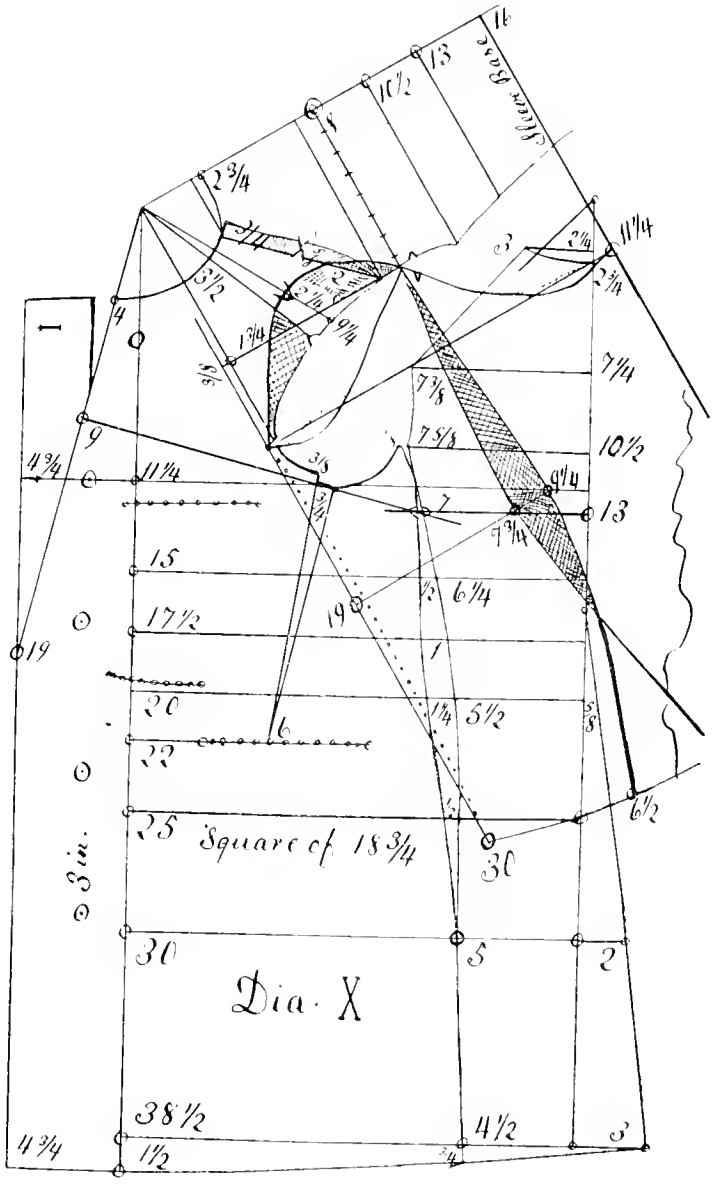


Copyright

DIA. X.

Dia X is a five-seamer overcoat for the normal, but leaning toward the erect form. The armhole is cut full forward to 45 deg., and the sleeve base moved forward two seams, or $\frac{3}{8}$ inches. The sleeve part of this diagram makes a close sleeve head, and a lap at 60 deg. may be made $\frac{1}{4}$ to $\frac{1}{2}$ more, and at 45 deg. it may be made $\frac{1}{4}$ more or any amount required to make a nice curve. The bottom of the armhole is plenty low, and the gusset on the top of the under sleeve fits it. The width of the shoulders may be made 9 at 60 deg. A half-inch lap between the armhole and sleeve at the back sleeve center, or at line 8, will make the whole sleeve extra easy, though the back sleeve may hang a trifle loose when the arm hangs down, but this $\frac{1}{2}$ inch extra length must not be accounted for in the sleeve length.

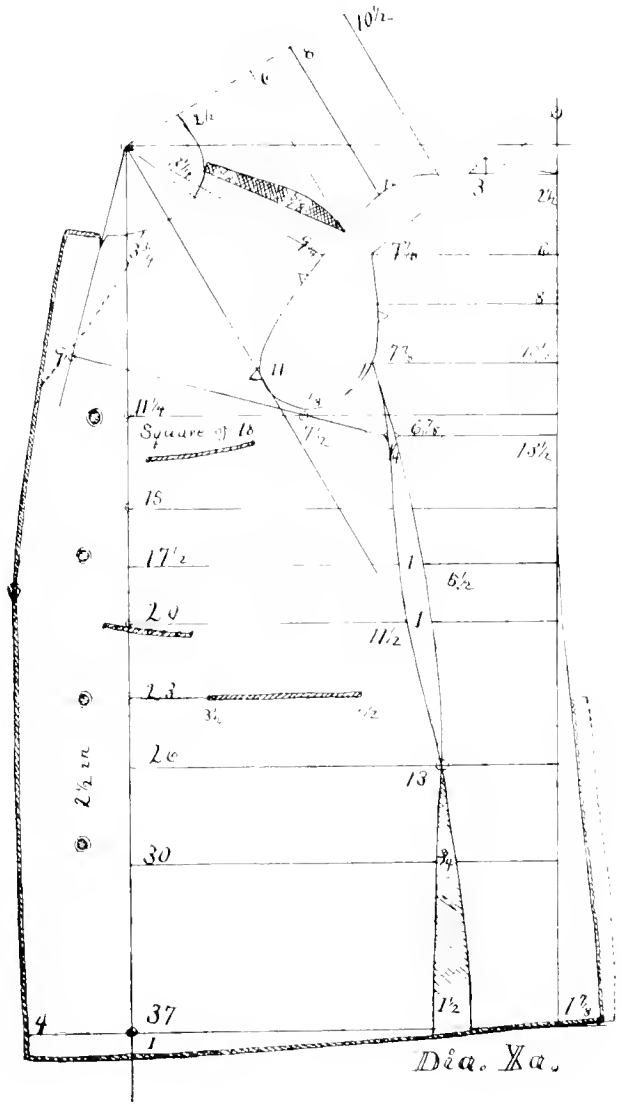
The square of the coat is $18\frac{3}{4}$ only, which is $\frac{1}{2}$ less than the regular calculation would bring it. An overcoat must be close-fitting, at and around the arm, though the armhole must be plenty large. Dia. X was made over a 39 pattern and if that same draft is measured and laid out with a scale of 38, the square will be $19\frac{1}{4}$, which $19\frac{1}{4}$ numbers correspond to the square of 18 on a three-seamer, taking in consideration the gore and the seams under the arm on a five-seamer. To cut over Dia. X the measure must be taken close over the undercoat, and the measure over the vest will make the fit not too close.



(Copyright.)

DIA. X a.

Is a three-seamed overcoat, and must be reproduced and made as fine work requires it, and the person who wears it must be well built, and with a rather small waist and seat. All clothing worn under the overcoat should be neat and well fitting. Erect persons should have the height of back at 13. The sleeve shown in Dia. X corresponds to Dia. X a. The collar must be sewed on easy, on and along the sides. The whole front edge may be made $\frac{1}{2}$ inch smaller than Dia. X.



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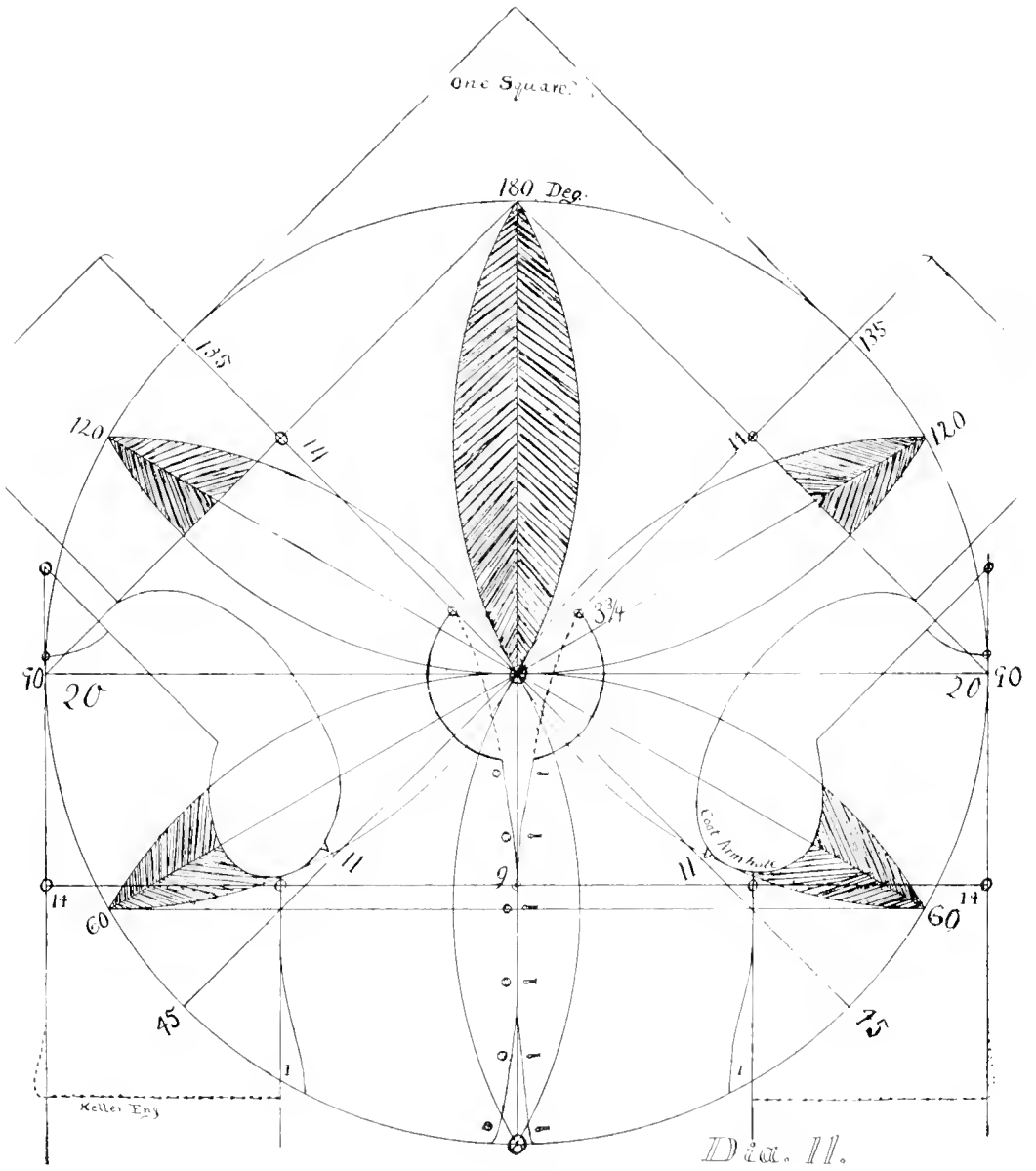
DIA. XI.

Dia. XI represents the garment in a three-fourths circle and on a square of 20. The circle itself would make the vest too short, but it represents the correct run of the bottom.

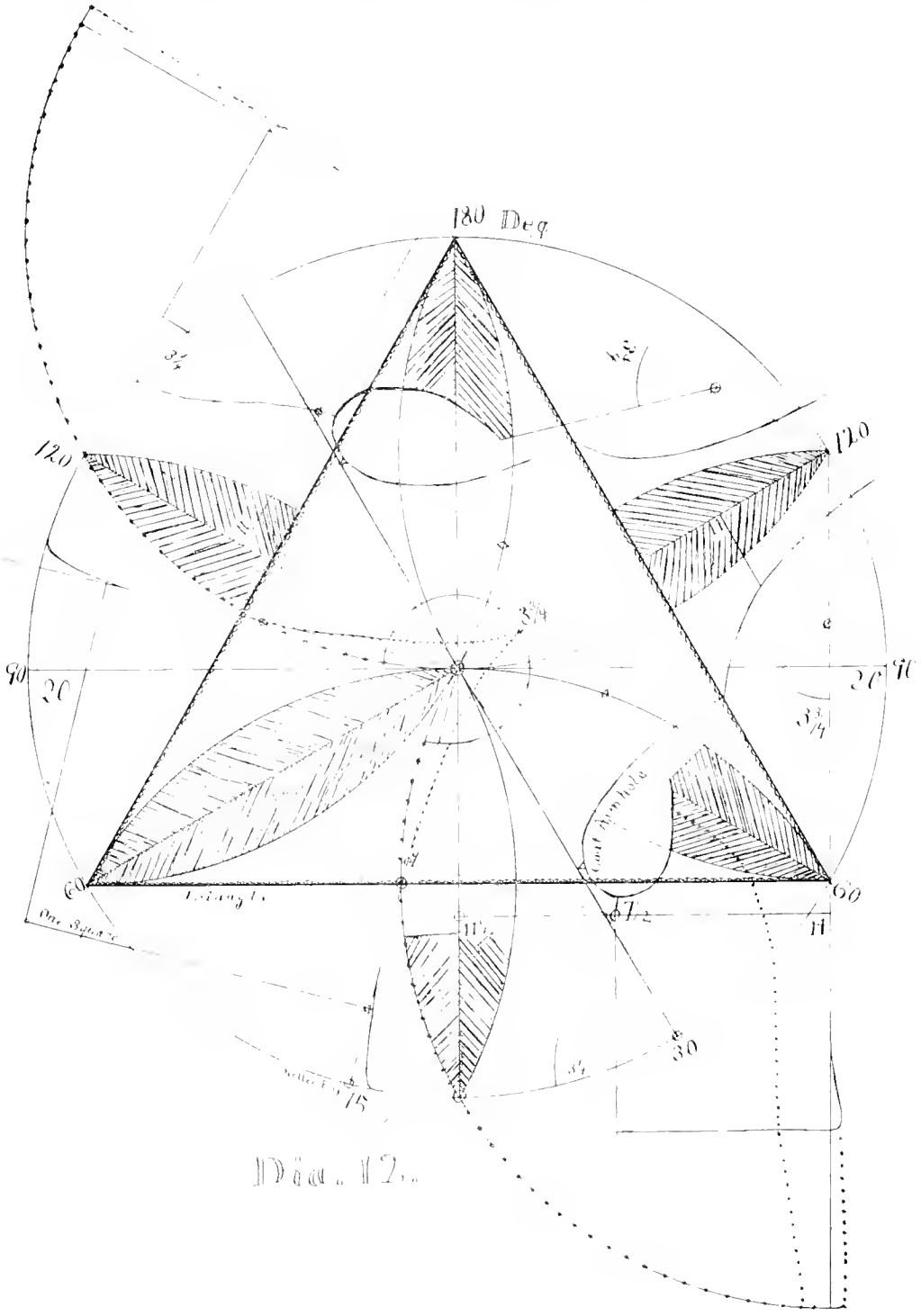


Dia. II.

(Copyright.)

DIA. XII.

Dia. XII represents the same as the foregoing in a three-fourths circle, but on a square of 17½, also the equilateral triangle of 35 numbers. Each of the Dia XI and XII are one square cut from the center of a circle, and in order to make it as simple as possible the vest is again used. The bottom of the forepart is on the circle, but that would make a short vest, and for this reason the back shows 1½ longer.



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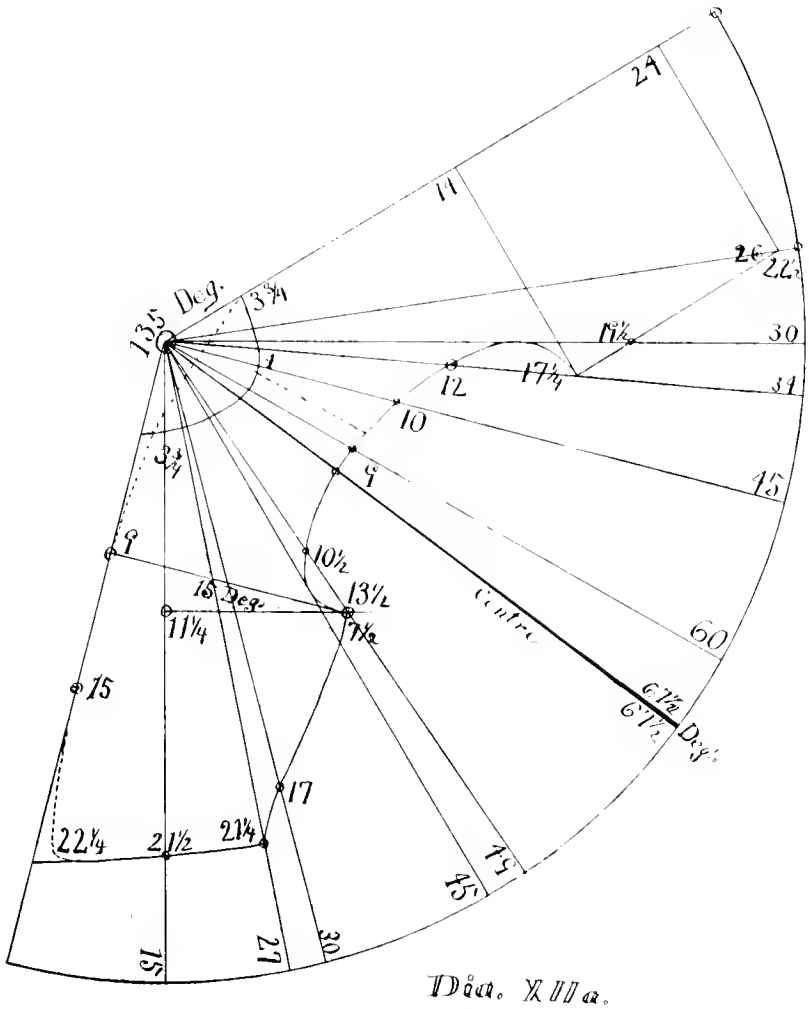
DIA. XIIa.

Dia. XIIa is made to illustrate all points obtained from the center of a circle, or from a point of the angle of 135 deg. All it requires is to lengthen the lines, so that they are long enough for the full scale. Any other point in any other garment may be found in the same way.



Dia. XIIa.

(Copyright.)

DIA. XIII.

This diagram I consider very valuable for illustration, because it represents an entire garment from neck to ankle in one continuous form, and on slopes in perfect harmony with the slopes of the body, running to a point at each end, each point at an angle of 15 deg., and both joined at the widest part, representing the largest part of the body, but cut off at the neck and at the feet. The upper part again represents the vest, as the simplest garment worn by man. The starting point for the garment is at a point where the angle of 15 deg. has a width of 17½ numbers. The connecting points of the two angles of 15 deg. are at the front of the waist, or at the pit of the stomach, where the body turns backward, upward and downward, and at the largest part of the seat. The lower point of the angle of 15 deg. is a center for the pants, from which center all connection for the seams may be swept with certainty. And, although this point is not convenient to sweep from for every pants we cut, a cutter must know from what point he can obtain his balance without going to the point- all of which is fully described in the article on "Pants."

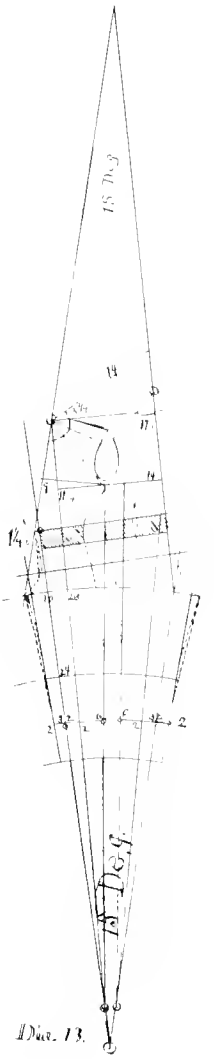
DIA. XIV.

This is simply the lower part of Dia. XIII, but the sides are closely connected on the angle of 15 deg., showing the pants in one solid sheet, which will fit the form of the bare body from waist to ankle. This diagram is in such a position that a new beginner may learn how to produce a nice slope for the side seam. But it is intended to serve for other and more important illustrations. It is to illustrate more fully the so-called back slope.

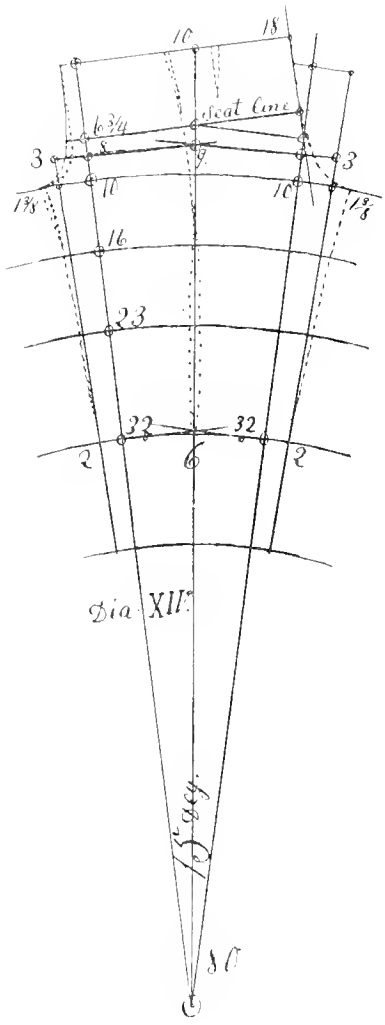
The upper part, or the waist, is in a perfect square from the front base. If the front and the back bases are laid on top of each other, all the sweeps from point 80 will fit together and the whole front and back will lay in position as most all pants are cut. From the position of this diagram, there is no side, nor back slope; it is simply a square block, consequently, the so-called back slope is only an imagination. But the most important point to illustrate is the following:

Considering the ankles 4½ inches apart, will give to each side 2, and the front base line would run down parallel with the center of the front, though slanting backward, and parallel with the front of the leg. Now, it is true, the lower part of Dia. XIV is on an angle of 15 deg., but the upper part is also on a square, and we will now consider the back square line finished clear down to the bottom of a pants, and cut out a square sheet of stiff paper, as long as a pants may be and as wide as the seat requires to go around it, say 40 inches both ways, and place it on and around the body of a person whose front of abdomen does not reach outside of a straight line, running parallel with the front slope of the legs, and in this position the sheet will fit to the body all along down in front, as well as the back of the waist from the seat upward. The center of the front and the center of the back run parallel up and forward and the square sheet will fit it but at the top of the side, and at the bottom of the side and at the bottom of the back the square sheet wound around the body will be too large, and must be reduced as follows: On top of side of waist one or two gores are cut to represent the difference between the seat hip and waist measure. The bottom at the side and at the back is reduced from a square to a slope of 15 deg., all of which is taken off from behind. It should be observed on Dia. XIV that the center of the front and the center of the back seams run parallel upward and forward above the seat lines, and from the seat lines downward, both the front and back forks start outward of the square, all of which is to be turned inward to pass forward and backward between the legs.

The square sheet must be considered for the outside cover, as though the legs were grown together. Again, a square sheet must be considered so adjusted to the upper body that the square sheet closes in all around the front from top to bottom, and from the seat to the waist in the back, but stands off at the bottom behind where the square is to be reduced to an angle of 15 deg. from seat to bottom. Whatever such a square, wound around the upper body is too large at the waist, must be reduced by one large or by two small gores at the top of side, and it will be found that the reduction of the angle of 7½ deg. is always the difference between the seat and waist measure, and if the waist is as large as the seat, no reduction is required, and if the waist is larger than the seat, allowance must be made at the side and in front. If that division is not properly made the crotch will show the fault, because the sides will take up their share, whether they have too much or too little cloth.



Diag. 13.



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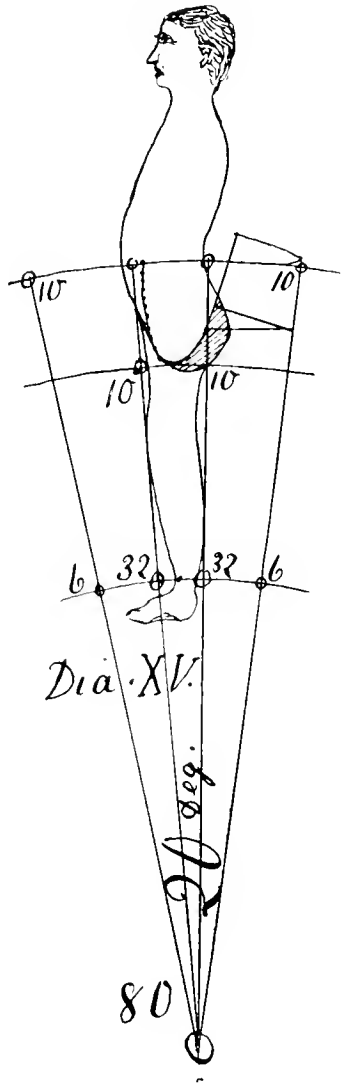
DIA. XV.

The figure on this diagram is poorly drawn, but it serves to illustrate. It gives the side view of the crotch, and illustrates why a larger waist must receive more cloth in front than a normal waist. Fig. I shows the pants from the front or back view, but this gives the side view, the back running backward and the front forward and away from the body. In this position the pants must be considered as in opposite position to Dia. XIV, and connected on the crotch seams. Dia. XV is intended to illustrate the bases for the small waist as well as for the large waist. On the small waist the body of the waist is even with the front pants base, but when the waist becomes larger the base will have to be considered as located inside of the front of the abdomen, as shown on the figure. When the base strikes the front of the body, as on a small waist, the front can be swung sidewise and backward on a straight line, and the back can be swung forward and sidewise, but in order to conform to the seat the back must form the sack for the seat first.

When both the front and the back is settled to the shape of the body, the center of each runs up and down and parallel above the seat line. The larger waist extends outside of the base and after the front is swung sidewise, to the side of the back, the front of the pants must be considered to be brought forward to the front of the body, the hinge being at the side, and when the front of the pants is swung forward with the hinge or swing fastened to the side, the centre of front is too small and must be supplied with extra width. Pants, as well as coats, are fitted from the side forward to the front and from the side backward to the back, and if the diameter of the center of the body from back to front is larger than on the normal form, the ends of the front will not reach the centre of the body in front and more waist proportion must be allowed there. The back must be considered stationary and requires no allowance behind, but may require allowance at the side if the waist is well filled up there. (See Dia. XX.)



In case of a back or forward leaning waist, Dia. XV will show that the crotch must be considered stationary, and the crotch must also be considered as a hinge on which the upper body swings back and forward, and that if the backward leaning waist requires ½ inch less cloth on top of front, the top of back must receive that ½ inch again, or else the so-called back slope will become too large.

The descriptions of Dias. XIII, XIV and XV should be well considered by every cutter. I have figured on them for over twelve years and the result is here given. Others might have done it in less time, but so far as I know, nobody has done it yet.

Copyright.

DIA. XVI.

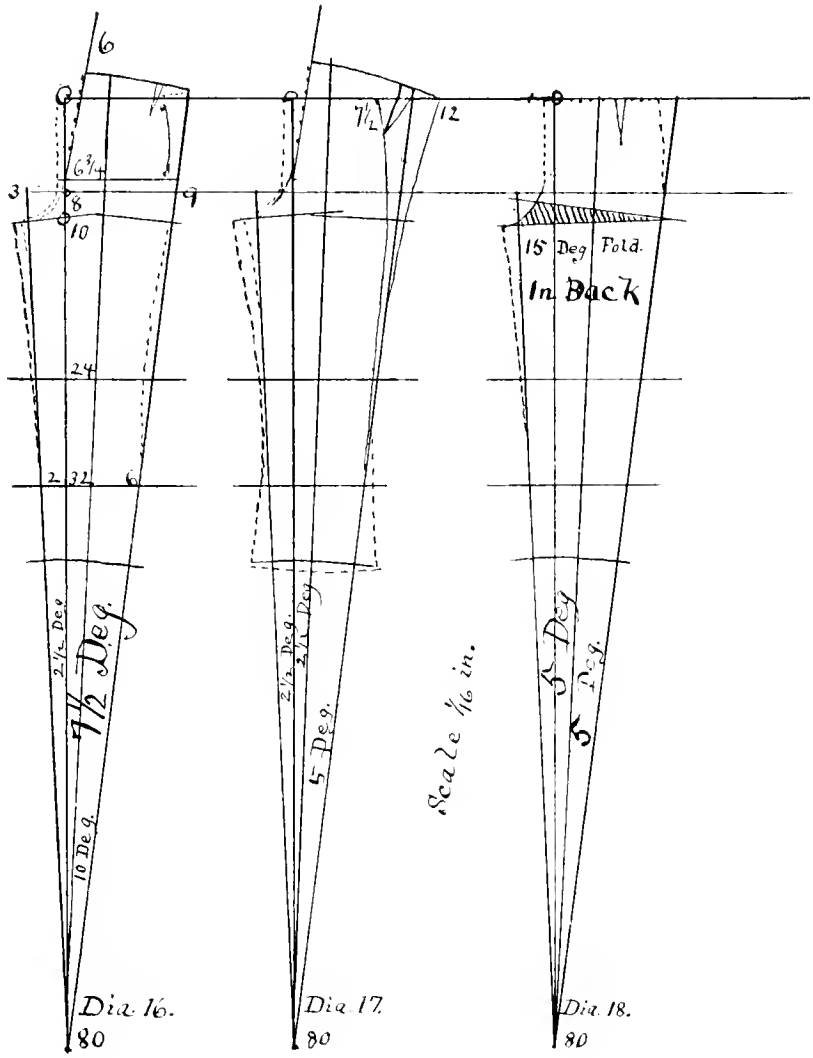
Dia. XVI shows the front and back of equal width except the tops of each.

DIA. XVII.

This presents the small front and wide back.

DIA. XVIII.

Dia. XVIII illustrates the principle of the fold in the seat, and the back and dress front nearly alike.



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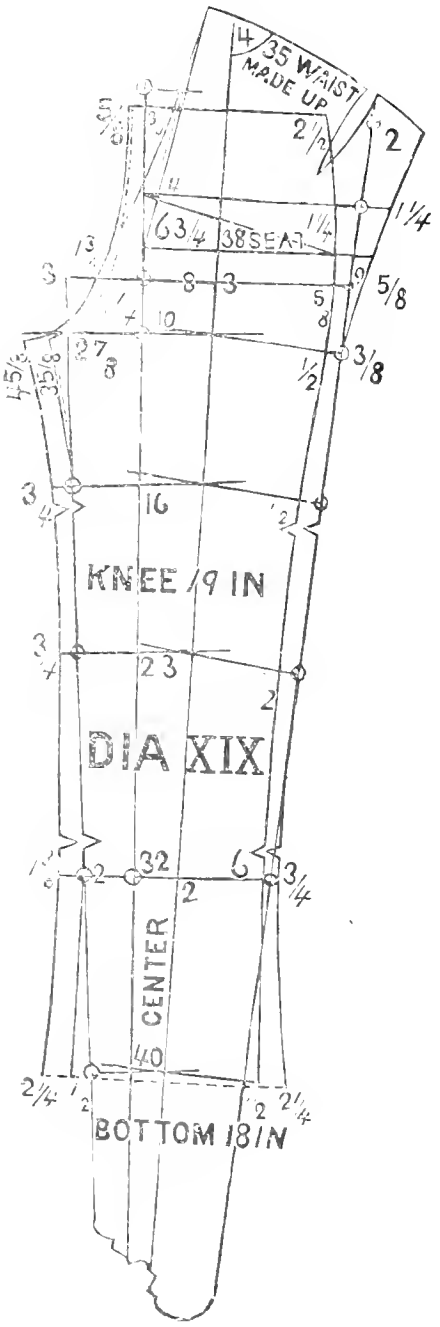
DIA. XIX.

Represents pants of the present style and fashion. The waist is as short as it ought to be for fine pants. Contrast the length of the waist with Dia. XXI. Dia. XIX is calculated for a size 38 seat with a knee 19 inches wide. If this is laid out with a 35 scale, the knee will become 17½ inches wide, which is a good width for a close fitting pants, which will soon come in style again. When small pants legs come in style again, the crotch of such pants will have to be reduced about one seam, and at the bottom the centre will be the same centre, while at the knee the centre of the angle of 10 deg. is also a guide, but there the outside requires about ½ less than the inside, because the inside of the leg is straight, while the outside is hollow.

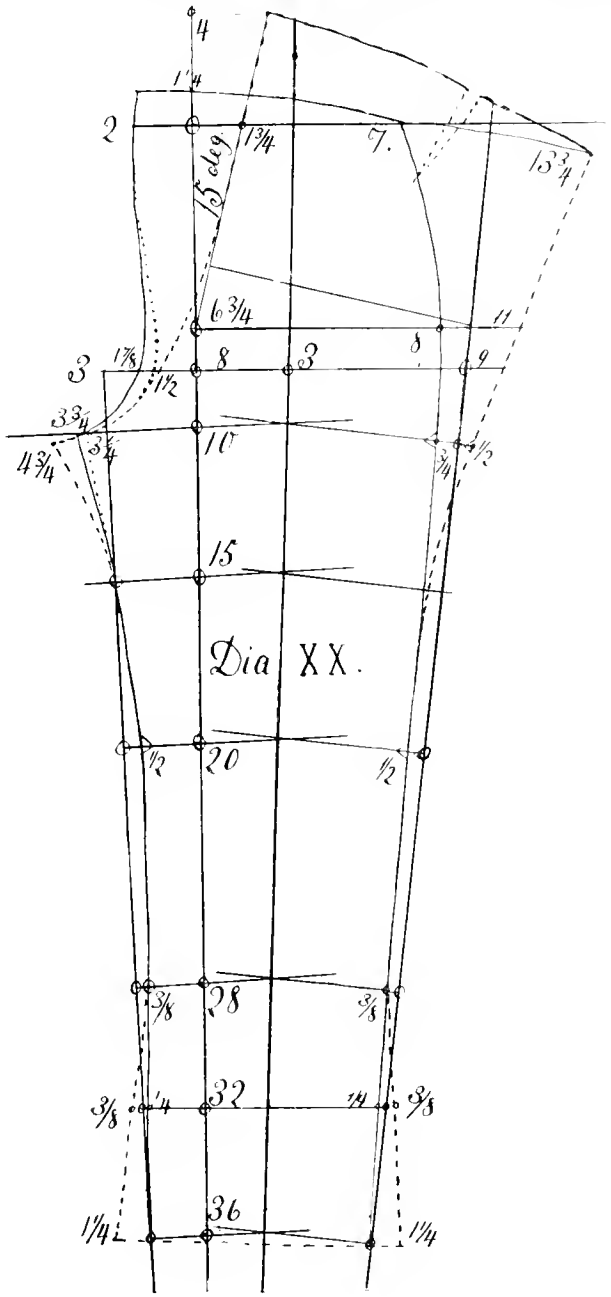


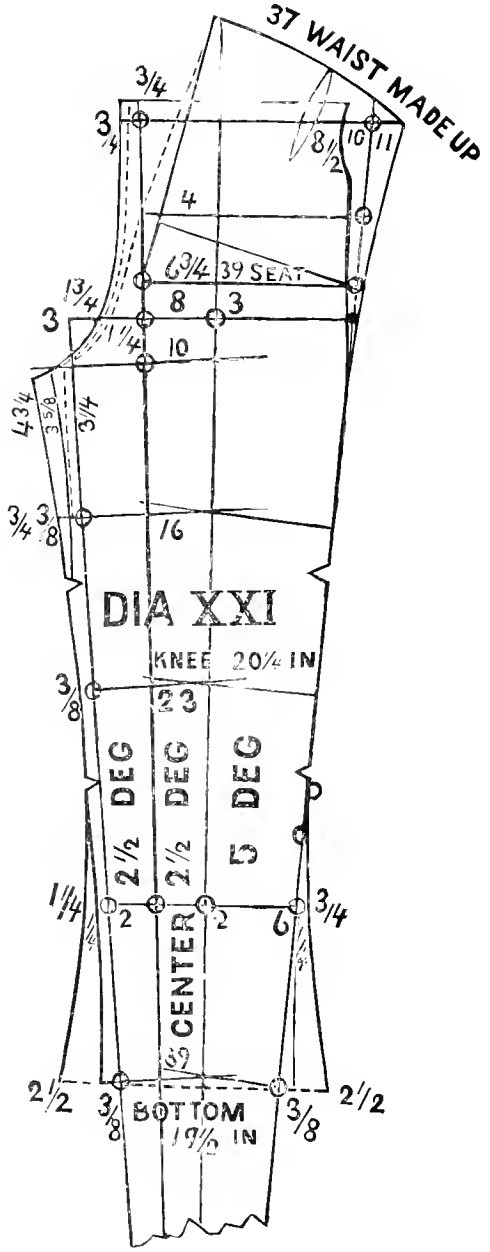
DIA. XX.

This diagram was made over a pants pattern of the following proportion: Seat, 46 in.; Hip, 47; actual waist measure, 46; waist as made up, 49 in.; knee, $22\frac{1}{2}$; and bottom, $20\frac{1}{2}$ in.

DIA. XXI.

This diagram was made for the purpose of illustrating a pants with a high waist, and how it is to be cut on top in order to have such a pants feel good around the short ribs, and still fitting at the hollow of the waist. The more spring such a pants has near the short ribs, the better it will be. But the buckle-straps must be set low, or at the hollow of the waist, so they do not draw that width backward. For the sake of making a change, I have thrown the top of front of the dress side out $\frac{3}{4}$ and the undress side is to be $\frac{3}{8}$.





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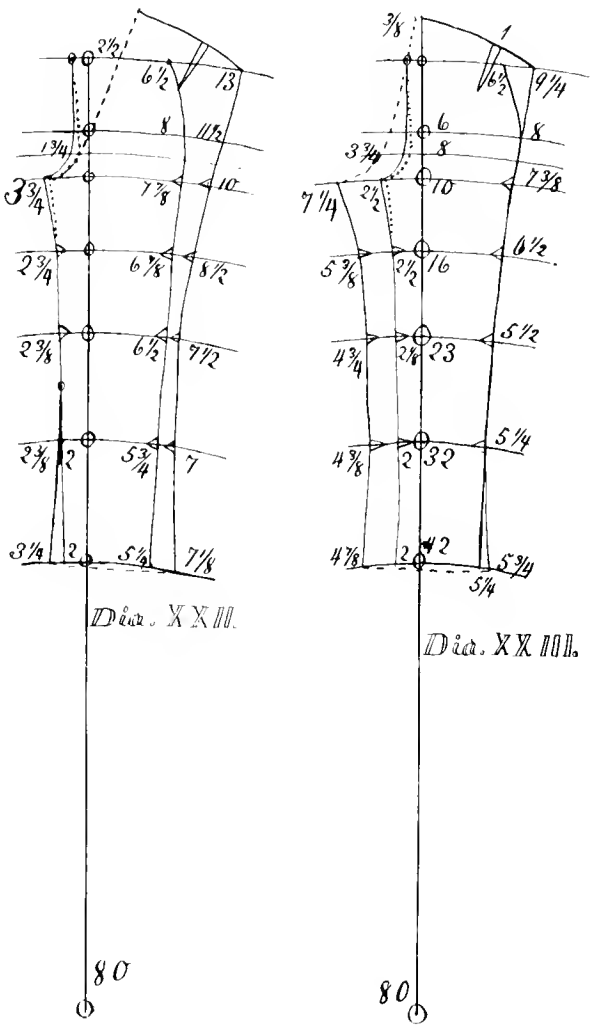
DIA. XXII and XXIII.

Are the same thing. They are here reproduced to give a correct idea of the so-called "back slope." Both are turned from point 80, or from the point of the angle of 7½ deg. All connections, or nicks for the seams are on the sweeps from point 80. The leg seams are dislocated, but the balance is the same, and both will fit the same when on the body, and I claim that there never was a truer pants system produced than is represented by these two diagrams.

The complete angles of the different degrees are not made, but the base line, running down to 80, is on the same spot on all foreparts. From point 80 the forepart of Dia. XXII is thrown forward, and in Dia. XXIII it is thrown sidewise, all of which may be imitated on a pants leg, after it is sewed up. Now it will be noticed that each of the two diagrams has a double side, on which it makes no difference where the nicks are located, as long as they are on top of each other, but the disconnected sides must be nicked by the sweeps from point 80.

Five years ago I sent the principle of Dia. XXII and XXIII to the publisher of the "AMERICAN TAILOR," and the answer may be found in the "AMERICAN TAILOR" of November, 1886, page 98. But as other questions were involved in the same article, and as the "AMERICAN TAILOR" pleased to notice me in 1883 about a certain challenge, I will reproduce the whole of it.



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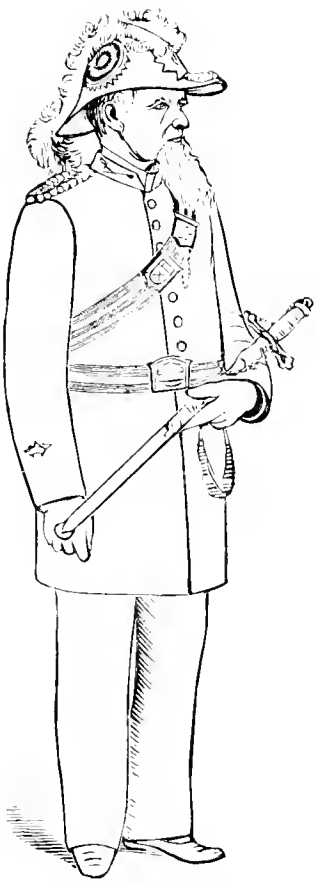


PATRIARCH MILITANT.

CLERGYMAN'S COAT.

(*Copyright.*)

In 1882 I had the following advertisement in the Tiffin papers, of which I sent a copy to the "AMERICAN TAILOR":

TO THE PUBLIC.

Having spent the best part of the last ten years in working out a scientific calculation of the outlines of the human body, I have, after endless ups and downs, discovered, and worked out, an entirely new and heretofore unthought of

PRINCIPLE OF GARMENT CUTTING

I am now ready to announce that my customers may rest assured that they will not only get a fashionable and well made suit of clothing, but that they shall also feel at home in it when they have it on.

Lest it be said that this is only a new game of brag, and to show that all present systems which are known are without a reliable base, I make the following

Challenge to any Tailor or Cutter of Gents' Clothing from Anywhere:

To cut and make a frock coat, a sack coat, a vest, a pair of pantaloons, and a whole garment from neck to ankle without any cross seams, for a person of any shape or form, whom none of us have ever measured or made clothing for, we will decide by lot—

1st. By what system or rule the coat pattern shall be cut;

2d. The number and size of gores (if any) the fore-parts shall have, and how many seams the sack coat shall have—5, 4, 3, 2 or entirely seamless, except shoulder and sleeve seams;

3d. How many seams the pants legs shall have;

4th. All widths and lengths of the several parts of each garment;

5th. All unforeseen questions arising from the above conditions.

Each to pay his own expenses, and all goods to be selected from the same piece and made up in the same style.

No garment is to be tried on the person it is made for until at a public trial, when the judges, selected by lot and who must not know who made them, shall decide, and their decision must be final.

This challenge shall stand good for three months, unless sooner accepted

G. F. HERTZER.

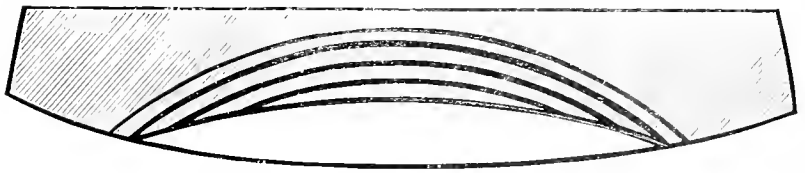
TIFFIN, O., January, 1882.

To which the "AMERICAN TAILOR" replied in the December number of 1883, in the following sarcastic style:

"THE CHAMPION CUTTER OF AMERICA."

According to the rules which govern sporting matters, the town of Tiffin, Ohio, has the proud distinction of being the abiding place of the champion cutter of America. Mr. G. F. Hertzer, the gentleman to whom we refer, issued a challenge some two years ago to all the cutters in the town of Tiffin in particular, and those who might be scattered here and there through the rest of the world, in general, to compete with him in a cutting match under certain conditions calculated to insure fairness. As the challenge was not accepted, Mr. Hertzer is, as we understand it, entitled to the proud appellation of champion cutter of America. It is in full accordance with the eternal fitness of things, that the championship should be located in Ohio, and in the liberality of our heart we are perfectly willing that it should remain there. As Mr. Hertzer's challenge was published in a local paper, it is within the range of possibility that it may not have been seen by several cutters, whose fault or misfortune it may be, to dwell outside of the precincts of the town of Tiffin. But, however, this may be, we are prepared to admit that it is not likely any cutter in this country, outside of New Jersey, would have had the temerity to have accepted it. Mr. Hertzer is, therefore, fully warranted in asserting that, '*this challenge* has not been accepted by any one, and now I claim that there is not a cutter or tailor inside or outside of Tiffin, who can accept and beat me, until he has my book on cutting, which, in due time will be published.' About the only suggestion that we are able to offer the profession, by way of consolation, is that when Mr. Hertzer's book shall be published they may be enabled, by purchasing and studying it, to compete with the author with some faint hope of success. Meanwhile, Mr. Hertzer wears, by virtue of the non acceptance of his challenge, the sonorous title of the champion cutter of Tif—no, of America. We take off our hat."

MODELS.



AS THE COLLAR SHOULD
BE PRESSED

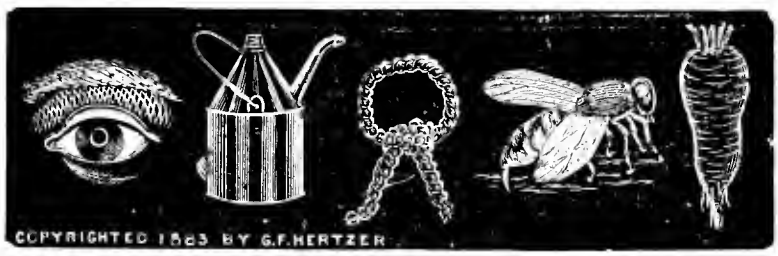
(Copyright.)

When I sent the principle of Diagrams XXII and XXIII, I enclosed the following advertisement, and other questions, which are explained in the answer:

"Be Diligent to Gain Knowledge for Knowledge is Power."

SEVEN POWERFUL REASONS

Why I claim that I cannot be beat



In fitting gents' and boy's garments and why I claim that I can beat any cutter in fitting large waisted men or boys, and persons with low shoulders or long necks.

1. I have spent more time, more money and more brains on the science of gents' and boys' garment cutting than any other cutter; and I can prove it.
2. I know more about cutting and fitting gents' and boys' garments than any other cutter, and I challenge any one to disprove that fact.
3. During the last four years I have challenged any cutter or tailor to go with me in a cutting match and I have had no response.
4. I can alter and refit any misfitting garment which your tailor may have sponged on you as long as there is cloth enough to do it with and the victim is willing to pay for it.
5. I furnish the material for garments cheaper than any other merchant tailor and charge no more for my work than those who cannot make the above claims.
6. Selling from samples, it is my interest to sell first-class material only.
7. I work and sell for cash.

The above reasons should induce everybody to entrust their next order of clothing to your obedient servant,

G. F. HERTZER.

The following sledge hammer blows followed:

From the "AMERICAN TAILOR" *of Nov.* 1886, *page* 98.

ANSWER TO CORRESPONDENTS.

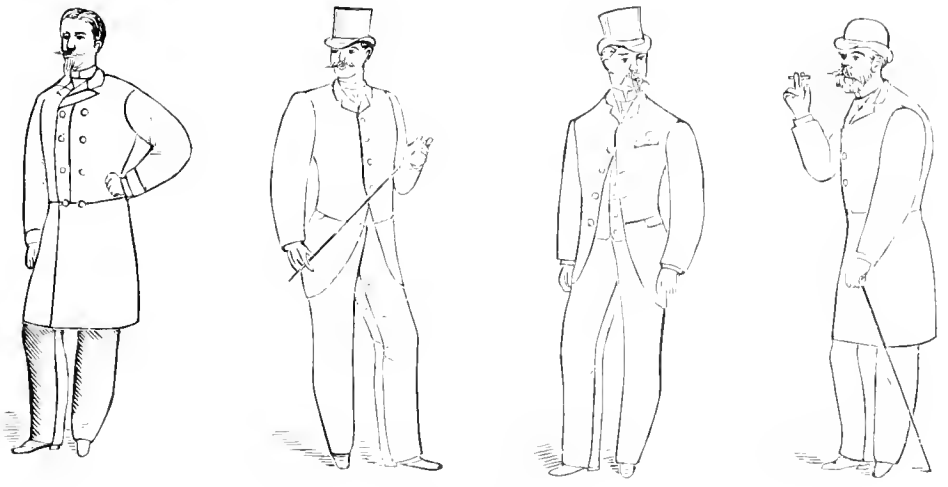
Mr. G. F. Hertzer, of Tiffin, Ohio, asks us in a recent letter, to give a combination of a frock and sack, having the same shoulders and explain the difference in the seams and account for the stretch, or shrinkage of the frock coat waist seam, which can not be effected on a sack. We are by no means certain that we understand what our correspondent means, but we think, that in the May and June numbers of this Journal for 1884 we gave the desired information. We cannot afford the time to enter into lengthy explanations of a problem unless it is clearly stated, and of general interest. Mr. Hertzer also asks the following questions:

1st. Why we give Fine Trade Designs without sleeves?

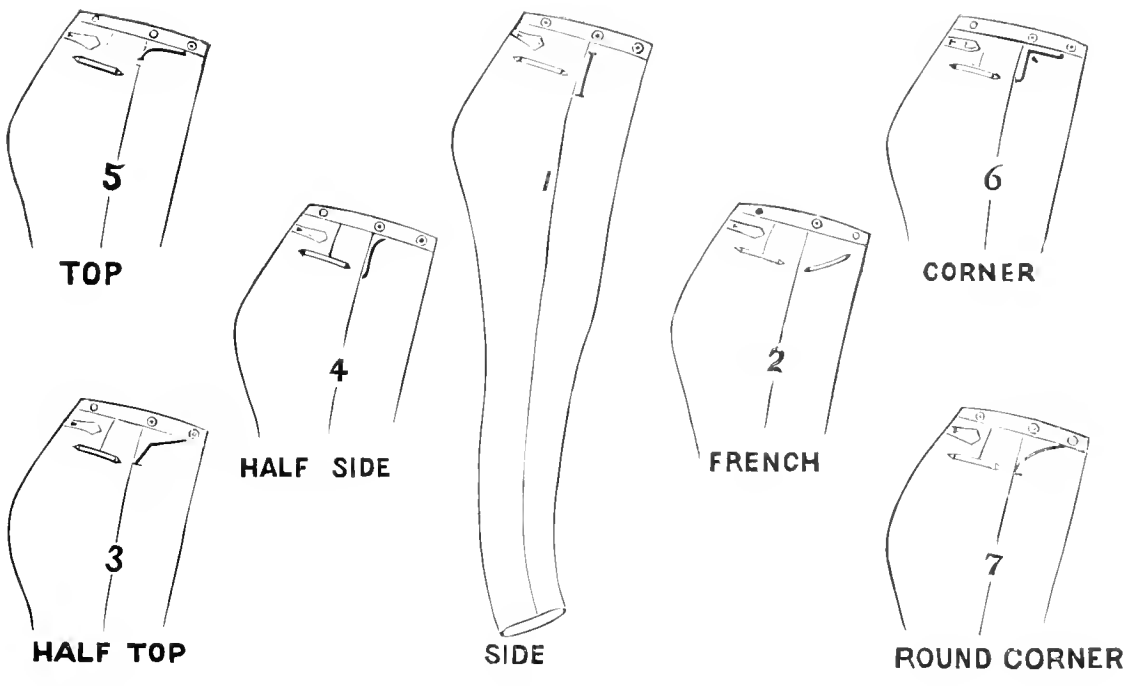
2d. What we mean by "half seye." "I asked," he writes, "the opinion of several cutters. One said it meant the half measure of the armhole, and another that it meant half the measure around the arm. Is either right? If so, can you find two cutters who would not make one or two inches difference in that measure?

In reply to the first question we would say that we have but twice given a "Fine Trade Design" without a sleeve draft. In one case we said that the sleeve should be drafted as taught in "Theory and Practice," but in the other omitted to do so, thinking, perhaps unwisely, that our readers would understand that it should be so drafted.

In reply to the second question, we desire to say that by "half seye" we mean half seye, not half knee, nor half waist, nor half anything else. The armhole of a coat is the seye, but a man's arm is not, therefore it is absurd to suppose we could mean the measure around the arm.



SHOULDERS.



POCKETS.

(*From a circular of Wanamaker & Brown.*)

If, as our correspondent suggests, there is a cutter living who cannot measure the scye twice without a variation of one or two inches, or if there is a cutter who cannot measure it fifty times with less than one-eighth inch difference, that cutter should devote his mind and muscle to hod carrying.

Our correspondent sends us, in his letter, small drafts of two trousers which look unlike each other, and asks us to tell him how they differ, and if each will fit the same man?

There seems to be no difference in the drafts, except in the location of the seams. But whether there is or not is of little consequence. Life is too short for us to draft the patterns to full size and devote an hour or so to the solution of a problem of no importance.

Mr. Hertzer concludes his letter as follows. "Since the foregoing was written, I have received the 'AMERICAN TAILOR' for this month and I see that others make the same request about frock and sack coats.

As far as I know the diagram on page 77 may be suitable to others, but I am not smart enough to derive any benefit from it, for it is not complete frock coat skirt is not in full, nor are the fitting points given on the front shoulder, and minus sleeve.

Should I use my own pattern and fail to make a good sack, you would say that my patterns are not correct, or that I did not follow your instructions. It leaves too many holes for you to slip out of. Now if you would give all the fitting points, then we would have a fair chance to try it. This is plain talk, but you always solicit the opinion of your subscribers, and here is mine without coloring."

This "*plain talk*" is about as silly as anything we ever read. The draft referred to is an illustration of how to cut a sack by a frock coat pattern, and does clearly illustrate it. It was not a coat system, and the skirt of a frock coat has no more to do with it, than a box of matches. "If a cutter drafts a sack as we explained by a poor frock coat pattern, he will produce a poor sack, but if he uses a good model, he will make a success of it. We don't "*slip out*" of anything, as our correspondent intimates, and certainly have wisdom enough to prevent our making ourselves ridiculous by endeavoring to get down to his intellectual level.

In an advertisement which was enclosed in the letter under discussion, Mr. Hertzer says: "I have spent more time, more money, and more brains on the science of gents' and boys' garment cutting than any other cutter. And I can prove it."

Possibly if he had spent less brains, he would have on hand a more liberal supply, than he seems to have in stock at present."

So far the columns of the "AMERICAN TAILOR."

The following local appeared in the Tiffin "TRIBUNE" of Dec. 9th, 1886:

TALK ABOUT A TAILOR.

If You Step on a Man's Corns He Will Howl.

This seems to be the case with the editor of the AMERICAN TAILOR. The November number, 1886, of that journal contains over a column of red hot shot against our townsman, G. F. Hertzer, for having an opinion of his own, and claiming that he has spent more "brains" over the science of gentlemen's and boys' garment cutting than any other cutter. If the AMERICAN TAILOR wants to prove that G. F. Hertzer is "silly" and with "not much brains left," he ought to come out and accept his challenge for a cutting match, and beat him on his own ground. Ridiculing him will not amount to anything as long as Mr. Hertzer turns out such nice fitting garments as he does at present.

A copy of which was sent to the editor of the AMERICAN TAILOR, and later I have enclosed a clipping of it, in every letter which I have sent to that office, but the editor being so far above my intellectual level, never answered, so far as I know.

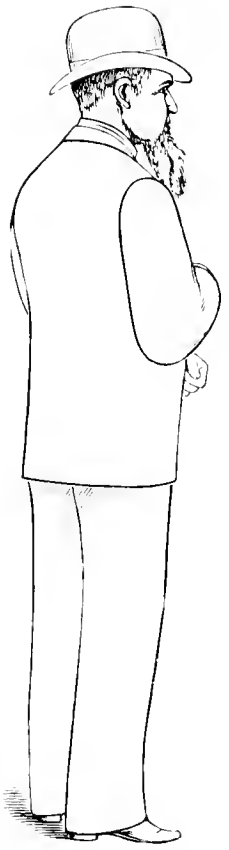
Now I have a Christian spirit in me, even if I do not come up to be a good Christian, for it is my misfortune to be always below the level, but having received enough slaps to make one cheek sore, I do now, as a true Christian, offer the other side, by asking more questions.

1st. Why did you use a poor frock coat pattern, for illustration, as you indicate, by saying: "If a cutter drafts a sack as we explained by a poor frock coat pattern," etc.?

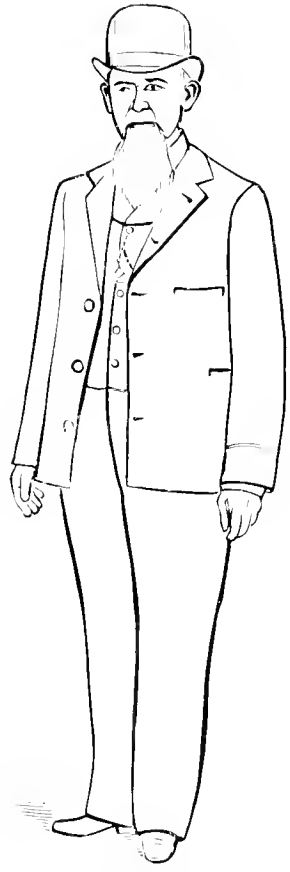
2d. Will not the diagram on page 77 in the October number of 1886, to which I alluded, produce the half sack coat nearly $\frac{1}{2}$ inch larger than the frock, by sewing one seam less on the sack?

3d. Will not the sack coat armhole be nearly $\frac{1}{2}$ inch longer over the back for the same cause?

4th. Will not the whole side of the back of the sack coat be nearly $\frac{1}{2}$ inch longer than the frock for the same reason again?



SEAMLESS BODY.



SEAMLESS BODY.

The coat, as represented by the above front and back views, I have on hand and intend to keep it, and anyone can examine it and satisfy himself that it is not misrepresented. My intention of making it, and representing it in this book, was to illustrate what a hot iron and a skilfull workman can do with a straight piece of woolen.

(Copyright.)

5th. Will not nearly $\frac{1}{2}$ inch more width, and nearly $\frac{1}{2}$ inch more length, in a sack coat back, produce the sack coat too large over the blade?

6th. Will not the extra length of nearly $\frac{1}{2}$ inch in the sack back armhole produce too much under sleeve behind?

7th. Must not all armholes of both frock and sack coats be the same, if one is to fit as good as the other?

8th. When was Miss Scye born? In what dictionary did she live in 1886? Where is her headquarters now? Is she single, or is she married to Mr. Arm?

NOTE.—Fig. I and Fig. and Dia. XV, and Dia. II, X, XIV, XV, XIX, XX, XXI, XXII, XXIII, were drawn and finished in ink by myself, and they are in my own writing. All others were made by regular artists, as they claimed to be, after my pencil drawings. But the above mentioned had so many mistakes that I had to throw them away and make new drawings. All Dia. in the Supplement are my own drawing. It may be that my lines and figures are not so nicely drawn, but I know that they are correct and that they are plain. It may also be, that in the opinion of some, I have drawn too many lines and put on too many numbers, but this book is not written for professors alone, but for students and new beginners in cutting, as well as for tailors, and can not be made too plain.

UNDER SACK COATS.

FOR a three seamed under sack, Dia. III and VIII answer all purposes. The parts of Dia. III place the height of back at 13½. A five-seamed sack is to be made, for three reasons: 1st. In order to put in more waist proportion in the side of the waist. 2d. To fit the over-erect form. 3d. To make an overcoat. The normal form can be fitted with a three-seamed under sack from the smaller sizes up to size 38, but the larger sizes out to be cut as five-seamed, because they usually require more waist. It is true smaller sizes have sometimes very large waists, but from one-half to three-fourths addition to the side at line 17½ will cover it. Boys usually wear sack coats; and, guided by this work, the breast measure for a boy should not be taken looser than that for a man, because the scale of one-half breast and 2½ in. will provide for that, to the full extent.

To make a five-seamed garment over Dia. VIII, for the purpose of giving more waist proportion, simply enlarge the square, say 1 inch, and cut out the surplus thus obtained from under the arm, or still better, leave it on the coat as an outlet but allow the seam on the under arm cut. I wish to add, however, that it is easy to stretch the side-piece on the under arm cut when it is sewed up, and it tends to improve the side if properly done; but if it is stretched at all, it must be done so upward, and whatever it is so lengthened, say perhaps half an inch, must again be reduced over the center of the back. All this may look trifling, but you must remember that half an inch more or less cloth in the length of the back will make quite a change in the fit.

To make a five-seamed garment, for the purpose of fitting an erect form, examine Dia. VIII, and you will notice a dotted "V" on line 17½, or at the hollow of the waist. At the side seam this wedge is five-eighths of an inch, and to fit the erect form this wedge must be folded up in the pattern; and to accomplish this on a flat paper the pattern must be cut through under the arm and above the point of the wedge, when the fold can be laid smoothly, but the pattern will divide at the arm as an artificial gore, representing the gore sidewise. The square will enlarge in proportion to the gore cut, and the upper portion of the back will fall downward and shorten from its original position five-eighths, or the width of the fold at the side seam. But although the back appears to shorten on top it retains its balance over the shoulder blade. The actual shortness is at the hollow of the waist. In folding up the gore across the side piece will cause the side piece to make a sharp curve at the side, and a sharp hollow or kink behind, and both must be straightened by cutting away the curve at the side and by filling out the hollow behind, so that the under arm cut will represent two straight lines. In regulating the under arm gore, two seams must again be allowed at the armhole, and the balance may be cut away, or it may be used as an outlet, which may come very handy sometimes. In sewing up that gore, the side piece usually stretches easily upward, say another three-eighths, and said three-eighths must again be taken away from the length of the back over the shoulder blade, and for this reason Dia. VIIIa has the height of back at 12½, or 1½ less than Dia. VIII.

For further explanation of this fifth sack coat seam, or under arm gore, and as to the difference between the erect and the large waisted form, I refer to the article on large waists.

Large waists and erect forms are mostly combined in one person, because when a person's waist grows forward the shoulders throw themselves backward, in order to keep the body in balance, and if this would not be the case, a large waisted person would tumble forward unless supported by something else. Anybody can see how this works. Take a normal waisted form with a coat which fits well in the back and place a sack of flour, or any other weight of fifty pounds, in front of this waist, supported by the arms, and the whole upper body will throw itself backward in order to keep its balance, and the back of this coat will become too long across the hollow of the waist behind, because the front of the coat cannot stretch like the body itself.

Diagram VIII a is made especially for the erect form, and is in all respects like Dia. VIII except the "V" closed up across the hollow of the waist, and the three-eighths stretch of the side piece upward, and the consequent shortening of the back of 1¼. The difference at the front edge cannot be considered a fitting point. If Dia. VIIIa is used for a large waisted form, which is mostly always erect, then the gore between the back and side piece should be cut like Dia. VIII, or nearly so. In all cases, whenever the waist becomes fuller, or the person more erect, the spring over the seat may be enlarged, and if it becomes too large, it is less trouble to reduce it than if the spring is too small. A good outlet over the seat and center of back of a sack coat comes very handy sometimes, but such a seam should be sewed by hand, because the machine will usually cut its edges.

Now, in considering the above, a cutter must observe if the form he intends to fit is erect or stooping, or large waisted, or if there is a combination of such, or other abnormal conditions. The single erect, or stooping, or large waist, or long or short necked person is very seldom to be found; there is mostly a combination of two or three abnormal conditions combined in one person.

The gores between the back and the fore part of both Dia. VIII and VIII a are cut out pretty close at the hollow of the waist, and it will never hurt any sack, cut over either of them, to have one-half inch more at line 17½. Dia. VIII a may be used for the normal form, providing the depth of the back is made 12⅞ numbers above line 9, and I have often used it for such with good results.

A sack coat with two seams and which is intended to conform partly to the hollow of the waist in the back must have a spring over the center of the seat, starting at the most hollow part of the hollow of the waist. Said spring cannot be obtained by allowing it at the side of the back which may be six or seven inches wide. Even if said spring were able to push the coat back over the seat it would at the same time push the coat upward and backward and away from the waist, and make it too wide and too long there. The only way to make such a coat good is to cut the spring, intended for the center of the back, at the side, and stretch the side of the back, under the iron, and at the hollow of the waist, and press the whole back in the shape of the pattern as in Dia. VIII and deduct the seam behind.

Sacks without any downward seams will never be in demand until we come closer to oriental fashions, or until we fall back upon cloaks. For the purpose of finding out how close I could come to making a reasonably good fitting sack in the back of the waist, without any seams downward, I have made four of them during the last 12 years. The first one I had to rip up again and make it up into a smaller size as a three seamer. The second and third I sold as cheap coats and the purchasers never found out that they wore seamless coats. They were better than a great many five seamers seen on the street, though they were loose coats at and around the back of the waist. One of them I had photographed on myself, both front and back views, and have the photo still in my possession. One back and one front view I sent to the office of the then "AMERICAN TAILOR," and a letter in my possession says that they consider it a good fit for such a coat. The last seamless coat I made last summer, 1891, and have it on hand now, and I intend to keep it at least for the present. A front and a back view of that coat will be found in "Figures and Diagrams." For the last six months I have kept it for a show coat, with a card on it offering $25 to any cutter or tailor who will make one like it, and which fits as good or better. So far I have had no call for the $25, nor did I expect a response, because it will not pay anybody to make one even for $25, and risk a fit. I made the offer to advertise my work, that was all.

The fit of a seamless coat must be put in by the maker, and it takes a cutter and a maker who knows what he is about, and one who don't care how long it takes to make one and what it costs; in fact, it must be a work done for pleasure—not for profit, except perhaps to gain knowledge, for "*Knowledge is Power.*" Now I will give a description of how such a coat may be made:

Select a good fitting sack coat pattern with three seams, and one which is not cut very close at the side of the waist, that is a sack cut pretty straight. The one I have on hand now is cut over Dia. VIII, and as size 36. The height of the back above line 9 over the front should not be over 13, but the top of the back should be placed at 2½, so that the portion over the blade is short and the top of back cut close to the point of the angle of 135 deg. If the top of back becomes too close to the neck, it can be cut down after the coat is tried on. On account of the short back, the armhole must be cut pretty low and well forward. The front must also be cut large and fitted to the body after the back has been regulated. After the pattern is thus cut, proceed as follows: Close the back and the front from the bottom to the hollow of the waist, lapping the seams; at the bottom of the armseye the front and back will lap over about 1¼ inch; fit the pattern to the back so that one seam is deducted from behind at the neck and at least two seams at the bottom, so that the hollow of waist shows as little surplus cloth as

possible. Over the seat, the cloth may be stretched in width, thus obtaining some artificial spring over the seat. Cut the back, and the back of the armhole to within 1½ inch to the front of the armhole and not quite as deep as the pattern. In cutting the pattern the back shoulder seam must be cut pretty low at the armhole and should be at least as low as 8 for the reason that the lap of the pattern at the side seam will bring both back and front shoulder seam too close together and would have to be pieced, but if the back shoulder seam is thrown down, and the front up, both will come out right. Now the next thing to be observed is to make an artificial wedge of whatever the back and the forepart lap at the bottom of the armseye, running out to nothing at the waist. This must be done by stretching the bottom of the armhole in width, and which stretch must be extended down to the waist, but nothing must be stretched at the waist, for the waist is too wide already, owing to the hollow of the back, in the pattern which can not be imitated on the straight coat back. That stretch must start at the point of the shoulder blade say about 4 in. from the center of the back, and must continue to the front of armhole. The stretch will throw the front of armhole forward of whatever the stretch amounts to, and for this reason, the front of the armhole must be cut 1½ in. backward, of what it is intended to be. After that artificial wedge is stretched in, the back side seam may be marked and stitches drawn in, and the forepart fitted to it and the front of armhole may be cut complete.

That all of this can not be done without trying on over so many times is self evident. Otherwise such a job must be made of material which stretches well, and must be made up thin and the lining put in plenty large, so it can give, and it would be best to make up without lining. Nothing can be accomplished by shrinking. Everything must be done by stretching. Plenty outlets should be left at the neck and shoulder seams and in front of the breast. Such a coat can not be fitted on the cutting board, but must be fitted on the body.

May be it is nonsense to write about a seamless coat, but I have seen so many absurd ideas advanced about cutting garments, that this may not be the worst. But a cutter who knows the true difference between coats with different seams, certainly knows more than if he is compelled to swallow anything the Fashion Reports please to dish out for us, in the shape of diagrams for new "Styles."

NARROW AND BROAD BACKS.

IN THE position of Dia. I or IV, it makes little difference if a back is cut narrower or wider at the bottom of the armhole, because all parts lie near to their natural position, which they must assume when the garment is on the body. A narrower and a broader frock coat back, cut with the same gore and with the same height as in Dia. II is apt to change the fit and may spoil it entirely. Dia. I, II, III and IV show a different height of the back. In Dia. I the height of front is 9 and that of the back is 11⅝. In Dia. IV the height of back is 11 on line 9 in front. In Dia. II the height of back is 15, but at the junction of the back and the sidepiece the line is dislocated and turned up, 15 deg. along the back. In Dia. III the frock coat back is 14¼ above line 9, and the sack coat back is only 13½ above line 9, though both sack and frock coat backs are even, and the same, from top. The difference of distance, to the point, where both strike line 9 on the front is caused by the smaller frock coat back and the wider sack coat back at their junction, and that position must be well understood by a cutter, because most all diagrams sent out by Reporters of Fashions are laid out in position as Dia. II, or nearly so, not because it is a true position but, because all parts can be cut without piecing.

Now, it must be admitted, that the position of the front, the back and the sidepiece of Dia. I are nearer in position to the body, at, and around the waist, than Dia. II or III, and though Dia. I is not in perfect harmony with the body, we must admit, that Dia. II and III are far more out of the way. It will be seen, that if the frock coat back of Dia. I were cut 1 in. wider at the junction with line 9 over the front, it would become ¼ shorter on top as soon as it was thrown in position of Dia. II, and the variation would be still greater, if it were done on a broad sack coat back. Observe that the frock coat back in Dia. III is higher on and above line 9, but when both are thrown down and in at the waist and parallel with the front base, both will assume the same height. As long as all the parts are cut in the same proportion, it matters little or nothing in what position we place them on the cutting board, but it matters a great deal whether they are in the right position when on the body.

The angle of 135 deg. is always the same, and from it the shoulder slope is 22½ deg., but, if we take the square of 17½ and make calculations from that base, the shoulder slope is 30 deg., but the parts are all the same. As long as the diagrams are laid out in a square of 20, as Dia. I and IV, the back may be made a trifle narrower or wider, and it will not endanger the fit of the garment, although it is always bad policy to change a diagram, and particularly a curved seam. A seam always represents something taken out, or something placed there, and a seam calculated for a certain point, and 1 in. one way or the other may make a decided change in the appearance, or in the fit.

The simplest garment is the vest as far as Merchant Tailoring goes; but simple as it is, there are seldom two cutters who produce it in the same way, and with the same result; and the same is true of coat and pants. This goes far to show that no true system of garment-cutting is in existence, or if it be, it is in the hands of cutters who do not know it as such, even by those who may use it—certain it is, that no such system is in print.

Now, I will consider the vest in its natural position, on a square of 20, although the gore under the arm will bring it out of that position again as soon as the seam is sewed up. Back and front being in their natural positions, or nearly so, we can cut the under arm seam further backward or forward without injury to the fit. But as soon as we make the width of the back considerably wider or smaller, we find that the height of the back above the arm-hole changes—when the back is thrown into an angle of 15 deg., or in a square of 17½. The smaller the back is cut, on the square of 20, the shorter it will become above the armseye, when thrown in a square of 17½, providing always that the turning of the back starts somewhere at line 9, which crosses line 11½ under the armhole, at an angle of 15 deg.

When both frock and sack backs are thrown downward and in a square with line 9, or parallel to the front base, then it will be found that the backs are all of the same length. Further, I refer to Dia. III, and line 9 on the front base. Lines 9 and 11¼ cross each other in the center of a square of 20, and the crossing lines are at an angle of 15 deg., for the simple reason that their bases are 15 deg. apart. The width of an angle of 15 deg. is ¼ of its length. In the case of forming a diagram within a circle, and on a diameter of 20 units, as in this work, we find the half-diameter 10 units, or 10 in., or 10 numbers of the scale, just as we may please to term it. That angle of 15 deg. is 2½ in. wide at 10 in. length. It spreads ¼ of an inch in every inch of its length.

Now, in case of cutting a vest, the back and front are cut through in the center of the square of 20 on line 9, and if the back is swung into a square of 17½ and parallel to line 11¼, the height of back remains 14. But had the back been cut 1 in. wider, its height would be 14¼; and had it been 1 in. smaller, the height would be 13¾. Had the back been cut 3 in. smaller, as for a sack coat, its height would become 13¼, and had the back been cut 6 in. smaller, that is, 4 in. wide, then its height would become 12½ only.

This is a regular "Fig.-mill," and has been bothering me for the last ten years, and strange as it may appear, I could never comprehend it myself, much less explain it to others, until now and during the years of 1888 and 1889. Here, then, is the result: If we have a good pattern we cannot change the width of the back while it remains in an angle of 15 deg., or in a square of 17½, without changing the height above the armseye. All patterns, or most all of them, are cut in, or pretty nearly in the position of the angle of 15 deg., or the square of 17½, for the reason that it is the most convenient way of cutting. A cutter must understand that; and, although it is convenient to the cutter, the parts of the garment are in an unnatural position at the waist, and he must be able to know how much they are at variance.

During the last ten years I have been pronounced as a "crank" when I claimed that I would yet show, that the height of the top of the back depended upon its width at the bottom of the armseye and not upon certain proof measures which are not proof at all. As to "crankism," I can console myself with the host of "*cranks*" who have preceded me, and who are to-day revolutionizing the world with their so-called cranky ideas. If it were not for the "*cranks*," the oxen would still be the principal "*threshers*" of the wheat to-day. Persons of small minds, and contracted ideas, who have never had an idea which they could sell for anything, or which anybody would accept for nothing, are the ones who are quick with reproaching another for being "cranks." But the term "*crank*" has no reproach for me, because all the various machinery which is used throughout the world to-day is turned and kept in motion by some kind of a crank, no matter if it be turned by *hand*, or *foot*, or by *horse* or *steam* power, or by *electricity*. Without "*cranks*" the world's machinery would soon rust, but as long as the boiler is not bursted, or the crank is not broken, just so long will we be kept flying, and by constant friction, we will be kept bright, and we shall be able to fulfill our destiny in this world, by doing our share toward making mankind, whatever the Supreme Architect has ordained it to be.

Garment fitting is not a positive rule. A garment is not made of sheet iron, where every sixteenth of an inch variation would give a great amount of friction. A garment that cannot stand one-eighth to one-fourth of an inch variation on almost any point is a misfit from the start. Again, the present style of men's garments is loose—always has been and always will be. Even when tight pants were in fashion they were loose over the body itself. Who will be umpire in the case of fits? Who will prove that a certain pants leg must be just so wide in order to make a fit, or conform to style? Who will contend that the waist of a coat must have just so much space, and no more nor less, to make a fit? Almost any reasonably well fitting coat can stand a little alteration in the heighth of the neck one way or another without injuring it. A well balanced 36 coat will hang well on sizes 35 and 37. If that is the case (and very few will dispute it), then it proves that a well balanced coat may be an excellent fit even if it has more or less cloth surface in some places than it might have.

Dia. III is especially made to illustrate my idea about the width of the back part of different garments, at the bottom of the armseye. The vest, with its height of back at 14, might also be placed thereon, but it is not, because I thought too many lines would spoil the illustrations.

In practical garment cutting, a cutter is often compelled to cut some backs narrower or smaller on the same kind of a garment in order to save material, or in some cases, when a larger garment is to be cut down to a smaller size, where the points around the back of the armhole, or at the shoulders, cannot be made even with our patterns, then it comes handy for a cutter, if he be able, to place certain quantities on either back or front and take it off on the other. Whenever that has to be done, lay your garments, or the pattern, out in a square of 20 or its equivalent, and change the parts in that position, and the lengths of the backs will take care of themselves.

This brings me to another point. An extremely broad frock coat back at the bottom line of the armhole requires a pretty straight sidepiece toward the back, and such a seam may be the better off, if the back is held a trifle full over the blade; while an extremely narrow frock coat back requires a very curved sidepiece toward the back, and such a back should be basted or sewed pretty close on the sidepiece toward the blade. Each of such backs assumes a different height of back when laid out in the angle of 15 degrees, and each requires a different treatment when sewed on the sidepiece.

All the heights of the frock and sack coat backs in this work are calculated to be of certain width at lines 9 and 11¼ over the front, and all back widths at that point should be as shown in the diagrams. The swing of the back, or the turning point of it, is calculated from line 9, no matter if the back lays in a square of 20, or if the back part of that line be turned 15 degrees. No article in this work is more important than this one, and every cutter should make himself thoroughly familiar with its meaning, because it is a new idea in garment cutting, and I will predict that in the Twentieth Century all cutters will recognize that principle. It may be brought to a finer point, but the principle will stand as long as the square and the compass are recognized and used. Neither do I expect such recognition without some "*tall kicking*," for few men will acknowledge that they have been groping in the dark while they have been claiming that they knew all that is worth knowing about garment cutting.

THE NECKHOLE AND SHOULDER SEAM.

IF it is not desired to connect the sleeve pattern into the armhole and on both seams, the shoulder seam may be cut into any shape or form as long as the balance is retained; but whenever we intend to connect the sleeve with the armhole, as in Dia. H or VII, we must cut the normal shoulder seam with a lap or spring of from three-eighths to one-half at the neck, and which lap must be run down fully to the middle of the shoulder seam and then reduced to nothing at the armhole, and in such a shape that the front part is on a curve. On a vest the angle of 135 degrees furnishes the correct slope, and with the neck band properly worked and turned up, gives enough spring around the side of the neck. But a vest collar and necktie give more bulk, and a coat is also cut closer to the center of the neck, and consequently a coat requires more width, or spring, in and on top of the shoulder seam, of which three-eighths is enough and five-eighths not too much, but it is always better to cut that part close, so that the collar may be sewed on easily; that is, the sides of the neck stretched say about one-quarter of an inch. Again, the coat collar gives more bulk than the vest collar and for this reason the overcoat requires three-fourths spring, as in Dia. X, which is cut still closer to the neck.

Policy, no doubt, has caused the fashionable shoulder seam to be thrown backward of the center of the shoulder, for the reason that it passes nearer to the shoulder blade, and a curved shoulder seam helps to fit it. If the shoulder seam were located on top of the shoulders it could not be curved, but would necessarily be hollow in the center, though the back and front lap at the neck. The position of the shoulder seam as in Dia. H allows the sleeve to be connected with the coat on both the back and front seams, and the lap of sleeve and shoulder give the sleeve enough width for all filling purposes, and the sleeve can never be too large or too small. I have tried my utmost to lay the shoulders in such a position that no lap would be found at the shoulder seam; but, after I considered that the back is never cut on the shoulders, I came to the conclusion that the said spring might just as well be there, inasmuch as by its use a more correct sleeve connection can be made.

On account of the lap between the back and front at the shoulder seam the top of that seam at the neck can not properly be connected, and for this reason should be notched at the center. The lap between the back and front of the shoulder seam and toward the neck may be accounted for in a different way, and as follows: The diameter of the body at the center of the back and center of front is almost double what it is at the arms, and if we turn the back forward and the front backward so that both meet at the shoulder seams, then the center of the body, or the side of the neck, requires a longer swing than the side of the body at the arms, hence the three to five-eighths more at the neck.

The five-eighths lap at about eight numbers from O, may also be accounted for as being required for the roundness of the shoulder blade, which is partially reached by the shoulder seam of a coat. Between the top of the shoulder seam and eight numbers from O, the lap, of whatever it is made, should not be even, but should be a trifle less a few inches below the neck, say one-eighth to three-sixteenth of an inch, as shown in the diagrams. This will give the finished shoulder a better appearance than if cut and made flat. The shoulders are hollow there, and the coat must conform to that, because a coat must fit there to the body and must be made to fit to the body there, it must hang and balance itself there, and if it don't fit there it must make a break, and in fact this is the only place where a coat is required to actually fit the body.

The shoulder seam for a vest must also be considered in particular. Dia. IV gives the vest shoulder seam without lap or gore upon the angle of 135 degs., and the top of back is cut as wide, at point 5, as the angle of 45 degs., and it may be cut one-half inch wider in order to bring it fully to the side of the neck, where the spring is required, but it should not be over 3½ numbers. Dia. IV requires that in finishing the neck, the neckband must

be cut long and sewed on full at the shoulder seam, say one-quarter inch, or plainer, the back should be stretched that much at and close to the shoulder seam. If a cutter prefers to sew the neck band even on the back, he must allow one-quarter to three-eighths spring at the top of the shoulder seam, and at the back, starting it about two inches downward.

Now it will be found that by reducing the spring at the neck of a coat to nothing, but leaving the five-eighths lap toward the blade, the great majority of stooping forms may be fitted, for it makes the front shoulder shorter, and that is all that a forward leaning neck requires. Stooping persons often throw their shoulders up, and such must be considered a combination of stooping and square shoulders. The lap of from three to five-eighths must always depend upon how the collar is sewed on. A three-eighths lap and one-quarter stretch of the neck-hole makes a better shoulder than a five-eighths lap with the collar sewed on close. A tight collar around the back and side will always spoil the shoulder. If a coat be too wide there, sew in the shoulder seam, but never draw in the side or the back of the neck with a short collar. A square shoulder may be produced by a lap of one-half between the back and front shoulder seam toward the shoulder blade, and no lap at the neck, and placing top of back at $3\frac{1}{2}$. The armhole itself must be the same for both the square and for the low shoulder, or the long neck. The lap of the shoulder seam requires that seam to be nicked as shown in the diagram. It is better all around if the jour. has a sure point at the middle to connect said seam, when he can baste up and down. He is less apt to throw one side up and the other down than if he makes the connection at the neck or at the armhole. To connect the shoulder seam with a satisfactory result, square up from line $11\frac{1}{4}$ and in front of armhole, and nick each back and each front on said line, which is even, to moving the forepart down on the front plumb line until the shoulders meet. In sewing the shoulder seam together the back should always be a trifle the fullest, because the back passes over the round shoulder blade and the front passes over the hollow on top of the shoulders, and should be stretched a trifle. By a trifle I mean about one-eighth of an inch on each side of the nick.

Locating the connecting point at the center in the shoulder seam, the jour. must be instructed to baste up and down, and if any part is too wide at the neck or at the armhole, to trim it off or let it stand as an outlet, but in all cases insist that both neck and armhole must have a nice slope after the collar is sewed on, or the sleeve is sewed in. If the cutting is done according to this work, there will be no trouble in obtaining a nice round armhole.

COLLARS.

(SEE DIA. VII.)

ALL top collars should be cut bias and without a seam behind. All under collars should be put on rather loose, but not full, at the side of the neck. The principle of a standing collar must be well understood, for it is a permanent thing, and to be applied equally in the construction of all garments with collars, no matter if it is standing alone or if a turn-down piece is attached to it. It is true, a separate collar can be fitted to the neck in any shape, and may be so fitted that the forepart and collar meet in front, allowing the standing portion over the back to go down anywhere. But this is not the principle for a standing collar, for the reason that it cannot so be applied on a vest, or any other garment, with the standing collar cut on the forepart. The neck-band of a vest, or the standing collar of any garment, has a certain function to perform. Whenever a vest is on the angle of 135 deg., the neck-band must lap over the back a certain distance, as shown in the diagrams. Whenever the neck is finished, said band is turned upward to the top of the neck, and in so doing it will form a spring near the shoulder seam to permit the neck to pass through; and it is just the same whether a turn-down piece or a turn-down collar is attached to it or not. If the neck-band is cut too low behind, it will form too much spring and the vest will be too wide at the side of the neck, and must be shrunk, which will never make a well-fitting job. If the band is cut too high at the back center, it will not have spring enough at the side, and the vest must be stretched, which, however, can be done better than if drawn in. But in either case, whether stretching or shrinking is required, I would advise the band being ripped open, the stiffening taken out, and re-shaped under the iron, which can easily be done. If a garment is worth altering at all, it is worth altering correctly.

A coat or vest of the present style, and likely to be for many years to come, is intended to reach up to the side of the neck where it (the neck) shoots nearly straight upward. The collar being an addition to the coat, it must be so constructed that it will turn aside and permit the neck to pass through. Now, the position of the standing part of a coat collar must be the same as on a vest, where the standing collar is not cut off, for it performs the same function. Take any good coat pattern that is furnished by a reliable firm and lay the parts out as in this book, and put the bottom of the standing part of the collar at the point indicated in the vest diagrams, and you will find that the front of the neck and front of the collar will not fit together, but lap over each other from 1 to 3 in. according to the size of the roll. The more it laps, the less roll it will produce, and if the collar and neck-hole were cut evenly in front, the collar would pull the lapel down to the bottom of the skirt. (See Dia. VII.)

I must repeat, however, that it is almost impossible to give a positive distance for the lap of the coat lapel, or a positive shape of the collar. We must watch fashion, and see how high the standing collar is, how much the turn-down is behind, or how wide the front is to be. A competent coat-maker can take almost any piece of bias cloth and canvas and press it into shape to make a good collar, but experience proves that not all coat-makers will or can do it. A vest with the standing collar cut off must have the neck cut out at the side, and at the angle of 45 deg., at least from $4\frac{1}{2}$ to $4\frac{3}{4}$; because the sewed-on standing collar must fill the place of the neck-band of a vest with the collar cut on. All vests with the standing collar cut on should have the top of the back cut as wide as the angle of 45 deg. at least, in order to bring the spring, created by the turning upward of the neck-band, to the side of the neck. If the top of the back is cut too narrow the spring will locate too far behind, and will be loose there, while at the side of the neck it may be too tight. All vests, with and without turn-down collars, should be cut alike at the neck. The turn-down part of the collar is simply a piece cut just like the neck of the vest, as shown in Dia. IV.

Now, it should be observed that if Dia. IV is made without a turn-down collar the edge must be turned in, consequently it loses a seam at the side of the neck, which seam must be reduced on a vest with a turn-down collar, because the edge is not turned in, but covered over with the top collar, and the difference should be at least $\frac{3}{8}$ of an inch—that is, for a turn-down collar the neck-band at the side of the neck should be reduced $\frac{3}{8}$ of an inch, starting at the center of the back and running out to nothing anywhere in front. In all cases the bottom of the neck-band remains at 5 on the angle of 45 deg., as in Dia. IV. This manner of cutting a vest for a turn-down collar enables the cutter to curve the neck just as he pleases, as the turn-down piece will always follow the curve.

In this connection it would, no doubt, be proper to speak of the cutting of the top-collar and its dressing, or pressing in shape, before it is put on, in order to produce the curve of the flat top-collar.

To cut the top-collar, turn the underside upward in front and above the top button, and even with the fore-part as far up as possible. According to the prominence of the curve, the top of the under-collar will fall over toward the arm-hole and toward the shoulder seam, and in this shape the top-collar must be cut; and, by all means, should be on the bias, on the most hollow part of the curve. In making up, the inside part of the top-collar must be well stretched, and pressed over, and shaped to the curve of the under-collar, and for this reason must be cut bias. The collar and the whole facing can be dressed under the smoothing iron just as the curve of the vest requires it by turning and pressing the standing collar part under. It requires a few extra touches to shape the top collar, and some cloth may be wasted in order to get it bias, but this is the best manner in which to make a well curved collar on a low-cut vest.

If any one will look up the authority on the cutting of garments of from 30 to 40 years ago, and particularly the works of Genio C. Scott, he will find that at that time vests "*without*" collars were produced by sewing on a neck-band with a "V" attached to it in the same shape as I have shown the front of the standing collar part in Dia. VII. This "V" sewed in produced the spring at the side of the neck. That sometimes proved a difficult task for me while learning the trade in order to get in a nice "V," and I suppose it would be a difficult task for some of our journeymen of to-day. But the world is progressing. To-day we accomplish it with a straight piece, and do it just as well, and perhaps better. All that is necessary for us to observe is, that the shoulder seam points to the side of the neck where the spring is required.

But, for the purpose of variety, I will propose another plan. Cut the vest as in Dia. IV. Leave off the neck-band and simply add $\frac{1}{4}$ of an inch to the top of the back and running out to nothing at about 3 inches below the shoulder seam. At the middle of the shoulder seam commence and put in a spring of about 1 in., giving half to the front and half to the back; then sew up, and you will find the same task accomplished.

If we turn the neck-band in Dia. IV upward until it meets with the top of the back, we shall find that a fold of about 1 inch will form on and above the shoulder seam, and all that is necessary is to imitate this by cutting a spring of $\frac{1}{2}$ inch to both the back and front at the top of the shoulder seam or at point 5. It is somewhat of a question whether it would be advisable to cut vests in this manner, but they can be as far as the fit is concerned, more particularly those cut with a cloth back.

Now I must say a word about coat collars in particular. In visiting different tailor shops we find that the dressing of the under-collar is accomplished in many different ways, and for aught I know all may be right—if they suit the customer, or if the collar is on, as it is required by the coat. Coats which require a collar to be stretched nearly into a circle around the back are often cut too low or too wide at the neck. For such a round-shaped collar may be required to close well in at the neck, but it will never make an elegant job, and such coats usually indicate too much cloth in the shape of wrinkles below the collar, or on the top of the shoulders. A collar must not run with the slope of the shoulders, but must turn upward at the side of the neck to permit it to pass through. It must stand up, no matter if a turn-down part is cut on or if it stands alone, as on military or clergymen's coats. A well fitting military or clergyman's coat requires for its standing collar nothing but a straight piece of cloth, and sewed on straight. It will not be too loose at the top, nor will it "saw" the neck sore in half an hour.

Now, a coat collar, with a turn-down, represents a standing collar over the top of the back and side of the neck, as shown in Dia. VII, and on that piece or wedge the turn-down part is added. This wedge, or the standing collar as shown in Dia. VII, must retain its shape as on a vest, but as soon as the standing collar is stretched at the bottom the spring at the neck is destroyed, and a tight or flat collar is the result at the side of the neck.

But to fit the standing collar and turn-down part together, so that the turn-down part is so much larger that it will go around the standing part without strain, the collar should be dressed as follows: Lay the whole under-collar flat on the table and turn and press the standing part up where it belongs, without stretching the outer edge of the turn-down part, and the collar is done. Whatever is trimmed off in front depends upon how far the lapel is to be drawn down. In this respect we all can learn something from an ordinary paper collar, which is a quite flat piece of paper—the break is not on a straight line, but on a curve of about half an inch at the center behind, and they all fit well. Many a cutter and many a journeyman would profit by studying the principle of a turn-down paper collar.

Of late years a great many overcoats, and especially ulsters, have been made with very wide collars, turning down about five inches or more. Such necks should be cut with the standing collar on the top of back and on the side of the forepart and running out to a point at or near the front sleeve base, and an extra spring of not less than one inch added to each shoulder seam, and evenly divided on back and on front. This addition furnishes the standing part of the collar, and the turn-down collar part is put on, just as it is put on to the vest, which will give form to the shape of the shoulder and not lie flat, as most of such collars are seen to-day.

See collar as it is to be pressed.

ARMHOLE AND SLEEVE.

SEE DIA. VII.

BOTH armhole and sleeves as well as the shoulder seam are very closely connected, and must harmonize. No matter in what position we choose to place the different parts of a frock or sack while cutting, they must all assume the same position at and around the armhole and shoulders when on the body. The question of locating the front of the armhole is solved in the application of the angle of 135 deg. The normal form has its arms at the center and side of the body, and Dia. I has its armhole in its center and side. If the old rule—front of armhole $\frac{2}{3}$ half-breast from back—holds good, then the back of the armhole must also be equally good at $\frac{2}{3}$ half-breast from the front base, as in Dia. I. There is no question but that the armhole may be made more or less without injury to the fit as long as the sleeve fits into the armhole. The front of the armhole is located two seams back of 45 deg., from the starting point, and on the front base, as shown in Dia. VII. This gives an easy-fitting armhole for a well-built form, but if the armhole is cut forward to meet the front sleeve base, it will not injure the coat.

It is generally claimed that a stooping form requires its armhole more forward, and an erect form more backward, but this is not always true. We find plenty of forms which bend the back, and throw the neck downward in front, but throw the arms and shoulders backward, and which forms do not require their armholes forward of the normal position. We also find forms which are very erect or straight in the back but throw their arms forward, and *do* require the armholes forward from the normal position. Now, no matter if the form is erect or stooping, the armholes do not require to be larger or smaller. Because a man throws his arms forward or backward does not show that his arm becomes larger or smaller. If the armhole is required to be cut $\frac{1}{2}$ an inch more forward the back should be that much wider. If the armhole is cut $\frac{1}{2}$ an inch backward the back becomes $\frac{1}{2}$ an inch smaller—the location of the armhole changes, not the armhole.

A cutter must also take into account the occupation of a customer. A musician who blows a great horn requires his armholes backward, and a full breast, while a person who plays the violin requires his armholes pretty well forward, or, at least, he needs extra length in the back sleeve seam, no matter if it is a trifle loose when the sleeve drops downward. But if everything is well balanced it is wonderful how small, and again how large, an armhole a man can have in his coat and feel good in either of them. But as stated, the sleeve must fit into the armhole, and for this reason we must consider the sleeve in particular.

When one or both arms are thrown into a horizontal position they show themselves as a sidewise growth of the body, like the limb of a tree, and consequently have their base in the center of the back, or in the center of the front. For the purpose of permitting the arms to drop down to the side, a wedge, or gusset, or a lap, is made between the top of the armhole and sleeve, which is taken up when the arm drops down into its natural position at the side.

At 60 deg. from the center of the back the sleeve and the shoulder lap $2\frac{1}{4}$ numbers for a close-fitting sleeve, and it is so shown in Dia. VII and X. At 45 deg. from the back, or at the top square line from the front base, the sleeve and shoulder lap 2 numbers. While the lap of 2, at 45 deg., may be considered as a permanent thing for all sleeves, the lap at 60 deg. may be considered as changeable, according to the style of the sleeve head, or according to the kind of the coat, as over or under coats. The lap of shoulder and sleeve, at 60 deg., also depends upon a low or a square shoulder, as well as upon a broad or a narrow style of the shoulder. Two and a quarter may be taken as the smallest amount to be allowed at 60 deg., and $2\frac{1}{2}$ may be considered not too much for any style, and $2\frac{3}{4}$ may be considered plenty for a very full sleeve head and a narrow style of shoulders.

At right angles with the center of the back and through the point of the angle of 135 deg., is the front sleeve base, to which the front sleeve seam is connected at point 11, and from which line the normal form requires the front of armhole backward 2 seams, as in the position of Dia. VII, and which is intended for a close-fitting armhole. On the back the center of the sleeve is 8 from the point of the angle of 135 deg., and there the sleeve and the coat connect even, and there the sleeve length must be transferred.

In taking the sleeve length it makes no difference if the length is taken 1 inch higher or lower, but in transferring the measure to the sleeve, the cutter must know where to transfer, no matter where the seam may be located. After the front and back are formed the top sleeve may be made wider on either seam, and the under side that much smaller, and notches cut accordingly.

Sleeve and back are to be connected at 8 numbers from O, and at the back base, but this is for normal forms only, or for the normal position of the arm only. Persons whose occupation compels them to throw their arms forward should have some surplus cloth at that point even if the sleeve shows too much cloth when the arms hang down. Surplus length allowed there must not be accounted for in the sleeve length. Another good way, to provide such sleeves with extra length at the back seam, is to throw the front seam of the sleeve, say 1 in. forward of the base and at the hand, which will cause the sleeve to extend forward easily with the arm. Such sleeves may also have more width at the elbows. Persons who most always reach forward with their arms should also have a trifle allowance, say $\frac{1}{4}$ inch, at the shoulder blade, and between the back and sidepiece, at line 9 over the front.

The bottom of the armhole is marked $\frac{3}{4}$ above lines 9 and $11\frac{1}{4}$ and the front of the armhole is $\frac{3}{8}$, or two seams back of the angle of 45 deg., all of which must be considered a close-fitting armhole, but there is no law to prevent the armhole to be cut $\frac{1}{8}$ to $\frac{1}{4}$ deeper and that much more forward.

In Dia. VII and X the upper armhole nick is placed at $67\frac{1}{2}$ deg. and the upper sleeve nick is placed at 60 deg., and both come very close together as long as the lap of sleeve and shoulder is not over $2\frac{1}{4}$ at 60 deg. Since Dia. VII and X were made, I have found that a right angle from the center of the back through 60 deg. at the armhole gives a rather better connection, and Dia. II, which was made later on, was made to show that way. At the same time Dia. II was made with the front of armhole close to 45 deg. and with a lap of $2\frac{1}{2}$ at 60 deg. The back nick at 8 and the front nick at 11 must be considered correct, but that much must be said: If for any reason the sleeve and armhole nicks must be changed, the sleeve will be the better if it is turned down in front and up behind, than if it turned the other way.

Now, the position of the sleeve and back enables the cutter to keep them in true balance. If the shoulder becomes a $\frac{1}{4}$ of an inch broader the sleeve loses that much, and if the shoulder becomes narrower, the sleeve must gain that much. If the armhole is cut more forward the back becomes broader and the sleeve that much shorter behind. If the armhole is cut more backward the back becomes narrower and the back sleeve seam that much shorter.

The stooping form requires the front of the neck-hole further down, and the top of back correspondingly higher, and for illustration, I refer to Dia. V, and the dotted line at the neck. If the neck changes, the sleeve center remains at 8. If the neck is thrown further down, the top of the back must be longer, and the front becomes that much shorter, but the sides remain. Besides, a stooping form can always stand a trifle extra length at the back of the sleeve, and $\frac{1}{4}$ to $\frac{1}{2}$ in. extra length there will always be found useful.

The top of the under sleeve I have represented in two different ways. The upper curve is especially intended for overcoats, because the overcoat armhole is cut deeper than the under coat armhole. The upward curve forms a gusset, or a wedge, which allows the arm to be raised on the same principle that the lap of the shoulder and sleeve on top allows the arm to be moved downward. When the arm is down, and in its natural position, the gusset on top is taken up and the one below the arm is hidden, and will not show at all. But if the arm is to be moved upward, it is there for supply, and the body of the coat is not required to go along.

The width of the sleeve, both at the elbow and at the cuff, most always depends on style or notion. A long sleeve must be smaller at the cuff than a short one, but a cutter should always inquire as to what a customer wants and write the measure down. In the absence of a positive measure, the elbow may be made $8\frac{3}{4}$ numbers, a little more for quite small sizes and a little less for quite large sizes. For the cuff, 6 numbers may be used for the medium sizes, so that size 35 may be made up 11 in. full. The smallest cuff, say size 23 to 24, should not be made up less than 9 in., and the largest cuff, say 48 to 50, is large enough with $13\frac{1}{2}$ in., but may be made 14 to 15 in.—all changes to be made at the elbow seam. There is a variation of perhaps 6 in. in about 25 sizes, or about

$\frac{1}{4}$ in. for every size. If we take 11 in. for the width of a 35 size cuff, we will be very near correct if we add $\frac{1}{4}$ in. for every size below that size, and deduct $\frac{1}{4}$ in. for every size above that number.

Dia. VII represents the armhole, sleeve and collar, and also represents the respective length of the cloak or cape. The cloak part of Dia. VII shows the full $\frac{3}{4}$ of that garment without any seam at the shoulders, but that would be too full for the present style; and the reduction must be made sidewise by folding the pattern at the center of the side, or at $67\frac{1}{2}$ deg., but point toward the shoulder seam and top of the sleeve, where the shoulder will open toward the neck as the shoulder seam. This shoulder seam may be called artificial because the real reduction is made at the side below. By making the fold, the circle must be re-shaped at its bottom, but the respective lengths remain as in Dia. VII. (See Dia. VIIa, which was made later.)

The armhole must be considered a center, or a permanent thing, and must not be changed for either the stooping, or erect, or long or short neck. If the neck be long, allow more shoulder strap, and if short, give less, as in Dia. IX. But if for any reason an extra loose armhole is desired, and it is thrown forward, then the front sleeve base must be advanced accordingly—that is, two seams must lap between the front of the armhole and sleeve, at 11, as in Dia. VII.

To sew the sleeve in the armhole: Clean the front of armhole of all hair cloth, if any is used. Between the front and the top nicks, cut all canvas and padding in, in three or four places, and cut the lining in, in one place, about 1 in. above the front sleeve nick, and about 2 in. deep, and cover it with a V. If the padding is thick, it should be so cut that no two cuts meet each other, so that when the cuts are stretched apart, that they still form a solid edge and not show the offsets on the outside. The front of the armhole should then be stretched under the iron, from point 11 to 60 deg., and care should be taken that the front of armhole is not torn, especially at the nicks. After such stretching the sleeve and the armhole will be nearly even, and the sleeve will require no fulling, or very little. Below the front sleeve nick the armhole is not to be stretched, unless it is done to make the coat larger. On and along the back sleeve seam, up to 45 deg. and down to the under arm cut, the back of the armhole should be secured from stretching by some kind of a stay, and after the seye is solid there, the sleeve should be held a trifle full, which makes a better hanging sleeve than if the sleeve be stretched. No sleeve hangs well in front if it be stretched above the front sleeve nick; and the same thing is true to the back part. A sleeve can be made to hang well in the back, as well as in front, if the coat maker knows how to work it, or the cutter knows how to cut it, and be able to give positive instructions.

Whatever the top sleeve is made broader than 8 numbers is taken off on the under side and the nicks for the sleeve seams follow the width of the top sleeve on both front and back. The center of the top sleeve is 8, which will produce a medium top sleeve, but the under sleeve will be rather full and must be reduced, say $\frac{1}{2}$ to $\frac{3}{4}$, on the front seam, or a fold must be laid under the arm.

By the normal position of the armhole, I mean that the front of the armhole is located within $\frac{3}{8}$ in. or two seams of the angle of 45 deg., and the sleeve on that angle as a base, so that the sleeve and armhole always lap two seams, one for the sleeve and the other for the coat, as in Dia. X and VII. For the bottom of the sleeve, sweep from 8 on the back, which is the center of the sleeve.

On the same principle that the back lining of a coat is put in large, the sleeve lining ought to be put in large around the armhole, particularly the top sleeve lining, which should be at least $\frac{1}{2}$ in. wider at each seam than the outside, running out to nothing at and below the elbow. Speaking of sleeve lining, it may be said here that fine tailoring may require the top of the sleeve lining to be felled all around, but it is often noticed that even on fine work the top part is sewed with a seam and the under side felled. Now, if we sew the top sleeve lining with a seam we may as well sew the under sleeve, for it makes clean work all around. It is done as follows: Sew the top sleeve with a seam as far as you can, then turn the sleeve lining right side out, gather up the whole sleeve lining from the bottom, and reach up through the front and sew around the balance. It is rather an awkward job for one not accustomed to it, but it works quite easily after a short trial. This would not have been mentioned here but for the fact that I have seen only one coat which had the sleeve lining sewed in that way, which was not made by me, and that coat was made in Indianapolis, Indiana.

Sewing in sleeves is a particular job in order to make them both alike, and it will pay a cutter to be particular in cutting the notches and requiring the jour. to place them together; for, if from any cause, notches on one sleeve are changed that the other sleeve is changed in the same manner.

Another fact must be observed: By sewing in the undersleeve a coat may be made a good deal larger or smaller. If the undersleeve is sewed in full and the lining gives, a coat may be made from one to two sizes larger than if the undersleeve is sewed in close, or the fullness laid in a fold. I have made many a three-seamed sack coat larger by enlarging the undersleeve and by well stretching the coat under the arm, and then piecing the lining down to the hips. A coat which is too small in the armholes and which is cut forward is usually ruined, because cutting the armholes forward will be at the expense of the width of the breast, but if a wedge is put in under the arm, either by stretching the bottom of the armhole or by the help of outlets, then the coat will be large enough in the arms and remain wide enough at the chest.

In general practice it is found that a great many coats fit better at the shoulders, without the sleeves in, and in all such cases it may be presumed that the top sleeve is too short, which causes the shoulder to break somewhere. Again a short top sleeve at the angles of 45 and 60 deg. causes the back sleeve seam and the whole back undersleeve to appear too long, while at the hand the sleeve is that much too short. The top sleeve is better if it laps $\frac{1}{2}$ inch too much than $\frac{1}{4}$ inch too little at 45 and 60 deg.

Between the square and the low shoulder there should be a difference made in the sleeve head, independent of style. The low shoulder requires a flat sleeve on top of the shoulder, and such armholes should not be stretched much, while the more square shoulder may have a sleeve cut with a fuller head, and the armhole may be stretched more. The width of the shoulders varies in style also, and it must be observed that whenever the style of the shoulders is broad the sleeve head cannot be as full as it may be made on a coat with the shoulders cut narrow. On the present style of female sleeves we can notice that they are all cut narrow in the shoulders, and with an extremely full sleeve head. Such shoulders would look horrid, if they were cut very broad, and with such big sleeve heads running up, and above the shoulders, several inches.

In making up, the jour. and the cutter must work in harmony, and in all cases, the jour. ought to know if the coat is for a low or for a square shoulder, and he ought to be able to work the shoulders accordingly. There is no sleeve system in existence which is as good as this, and I claim that there is no probability that anything better will be brought forth. Others may be able to give it a finer polish, but the principle will remain.

CENTERS OF THE BACK AND FRONT.

BOTH of these centers must be very nearly on straight lines, as is proved by the fact that a vest can be fitted with very little curve on the center of the back or in front; and in fact, can be fitted from the waist to the neck with quite straight lines by simply cutting a trifle of a gore sidewise, either at the waist or at the neck, or at both. When we examine the body closely we find that it is not round, but has four well-defined corners, two in front at the center of the breast or at the nipples, and two in the back at each shoulder blade. If any reduction is required at the waist it should be made at these locations, for they are the turning points of the body. Between these points the normal body is perfectly flat in front and at the sides, though in length the front is curved, while the back is mostly hollow; but for all that, the normal back may be considered flat from blade to blade, as the hollow between is not intended to be shown, but concealed. If we view the body from side to side, the back and front appear to be a sharp curve, as is shown in Fig. 2; but if we look at Fig. 1 we see both back and front flat. If a body were to be pressed flat from side to side, and then a cover cut for that form, both the center of the front and back would necessarily be cut on curved lines, because it would be essential to fit from front to back, or from back to front, just as we may take it. But on the human form both front and back must be fitted sidewise from their respective bases, and as both of the bases are on a flat surface it follows that both of them must be fitted, or nearly so, on straight lines, at least as far down as the hollow of the waist.

If we take a sheet of stiff paper we can fit it over the back and chest, and from arm to arm, all the way down to the hollow of the waist in the back, and to the turning points or pit of the stomach in front, with scarcely any break or wrinkle in the paper, which shows that the center of the back or front must be fitted on straight lines, and that all reduction, as shown in Dia. II, or all additions, as shown in Dia. I, at the waist must be made sidewise or nearly so. The reduction of the back of the waist depends entirely upon the position in which we choose to place the different parts. In fact, it may be claimed that the waist reduction of the back is wholly imaginary, because the whole part of the body between the arms and waist is a flat surface, and can be fitted with a straight piece of cloth. Considering that the natural position of a garment when on the body runs from the shoulder blade downward and into the hollow of the waist, it must come in contact with the seat below, and must be sprung outward, but differs somewhat according to the nature of the garment—all of which is clearly shown in the diagrams.

All the different shapes of gores or wedges in the back of a frock coat we can make, because we can open or close the sidepiece and back, upward or downward. On a vest with a straight back, we must cut it just so, and not otherwise; and a vest back must have a trifle spring over the seat in the center of the back. If we cut a vest off at the hollow of the waist, we can connect the sides also on straight lines and the whole garment can be cut with but one seam in front. In this case, however, we must consider the following: If the square of 20, with one inch cut out under the arm, and sewed up, fits the body, the back and front are not in that square any longer; but that square spreads on top, and contracts below, about $7\frac{1}{2}$ deg.

But while the square of 20 is thus contracted at the waist, it spreads apart on top, or above line 9, and here a reduction of the waist would be visible as a gore above the armseye line in the armhole, but which is cut away and that gore is invisible on a vest. But even a vest on a square of 20 would necessarily have a gore there if the armhole would not take it away, and if the seam is thrown further backward, as in a sack coat, that gore will show; and if the seam is thrown still further backward, as on a frock coat, it will show still more, because the armhole does not approach it so closely.

Now, all of this shows that two straight edges can be joined together and fitted over the center of the back or front by cutting the gores sidewise, and thus compelling the straight back and front of a garment to conform with the bend in front and the back in length. The center of the front cannot be manipulated like the back, because there are no seams in the forepart passing from one end to the other, except in a double-breasted coat with the lapels cut off. It is true, we can cut small gores under the lapel or at the waist to make the forepart conform to the body, but they must be well understood by the cutter as well as by the coat maker.

We all know that a great many good coats are made every day without any gore whatever in the forepart, but we also know that such coats are pretty well worked, and the front edge drawn in, which is equal to cutting a gore somewhere. A gore under the lapel is always vexatious in the hands of an inexperienced journeyman, for it is quite easy to throw the shoulder of the garment out of place when basted on the canvas. For this reason no gore under the lapel should be sewed up until the forepart is basted on the canvas or padding, after which the canvas should be cut in just the shape of the gore, because a flat canvas will spoil all effects of a gore. On a double-breasted coat, with the lapels cut off, an exception must be made, when the lapels are sewed on before the foreparts are basted on the canvas. Within said lapel seam may be obtained all necessary oval form required for a forepart, and all other gores under the lapel are apt to do more harm than good.

But there is no question about the usefulness of a gore under the lapel of a double-breasted sack coat, and I may say it is indispensable there, for no double-breasted coat can be made to conform with the shape of the body unless one or two gores are cut somewhere. A lapel may be obtained without a gore in it, but as soon as the coat is to be buttoned up completely, there will be surplus cloth between each button and buttonhole, or the collar will be too loose under the chin, or the front of the waist will be too wide.

Now all of these faults—loose collar, long front, or large waist—may be overcome by simply cutting a gore of $\frac{3}{8}$ in. in the center of the forepart at the waist seam of a frock coat, and I deem it necessary to give that gore particular attention. When we take a sheet of paper and spread it over the front of the breast, we can fit both fronts from the neck down to the pit of the stomach with that straight paper. From the pit of the stomach down it will stand off from the body, just as the front line of the angle of 15 deg. stands off in Fig. H. Now, to bring that surplus width in front of the waist to the body it must be reduced by cutting gores. One large gore in the center of the front would be all that would be necessary to bring the sheet to the body, but that would throw too much surplus cloth on the top of that gore, and all on one spot, and wrinkles would form across the front of chest, as in the case with all coats which are cut away in front of the waist and forced forward in order to button up. To reduce the front edge only will make it a cutaway; but that will never conform a coat to the oval body in front. Now, the more gores we cut the more will everything be divided and the better it will fit. So, in place of taking one large piece from the center of the front, we may cut three small gores—one in the center of the front and one in each middle of the foreparts under the nipple. The one in the center of the front is made in the edge, or the seam, and is simply a reduction of the front edge. The two gores in the middle of each forepart may be considered $\frac{3}{8}$ in. cut, and two seams, or $\frac{3}{4}$ in. in all. These cuts will balance the front and give all the oval shape which the chest of a male requires.

On military or clergymen's coats a cutter is compelled to make one cut in each middle of the front if he wants a good front. On such coats no gore can be cut at the front of the neck. The natural run of that gore is straight downward, starting at the nipple, or wherever the front of the body turns backward toward the front of the thigh. But we cannot cut them all the way down through the skirt, and so we turn it forward at the waist seam.

It will be noticed that Dia. H is cut without that gore, but it is thrown into the lapel seam, and the large gore upward is the result. If Dia. H is made with that gore, then the front must receive whatever said gore takes up, say about $\frac{3}{4}$ in. more.

Military and clergymen's coats should be cut pretty straight in front and should have a large gore, say $\frac{3}{4}$ in., cut in the middle of the forepart, and starting high up; and the center of the front should not be drawn in with a stay, for this drawing in of the front edge will largely return and show small wrinkles at the edge, particularly on fine broadcloth. If all the surplus cloth is cut away and balanced by that gore, then nothing is to be drawn in, and a stay at the edge is simply put on to keep it from stretching, and to confine the canvas closely and permanently to the edge.

On single-breasted sack coats a small gore may be cut under the lapel, particularly for a longer roll. If a gore is cut for a short roll the collar must be quite straight in front, or else the lapel will pull too far downward.

But for a short roll it is just as well to omit it altogether, or balance it otherwise as follows: After the forepart has been basted to the canvas, cut two or three gores in the canvas over and along the chest. Cut each gore about $\frac{1}{2}$ inch wide, and about 3 in. across. Around these gores secure by good basting the position of coat and canvas; then draw the gores together, and shrink away the fullness of the outside, which may easily be done, then put the stay on even—by which means all surplus cloth, usually cut away as gores in the front of a frock coat, is used up and balanced in a sack. Drawing in the canvas without cutting it will never make a smooth job. But all this requires—that the coat be made by one who knows how to make it, and is willing to make it as it ought to be made. Otherwise it would be best to cut a sack without that gore.

On a double-breasted sack the gore under the lapel should be large and all surplus cloth taken away there, particularly so if the coat is to be buttoned up to the chin.

The diagrams show the position of the center of the back and front as well as any description can make it, but the reason why I have been describing it so closely is, that I desire to show the why and wherefore all seams are precisely so and so. Neither do I claim that they must all be just so, by the least fraction of an inch, but to show a general law which governs the whole. I must refer to still another important point. On a sack coat that is sewed up all around over the seat, or nearly so, the side seam and the seam in the center of the back may be both cut oval so as to give the form of the seat, particularly on a short sack. On a frock coat the back center is thrown out below the tack, and all roundness over the seat is produced by two curved lines on the side of the back and side of the front skirts, all of which is shown in the diagrams. The center of the back is open below the tack, and a curved line there would simply produce a curved edge, but would not give the oval form to the garment. If it is desired to roll the lapel further down, a gore should be cut somewhere in the forepart, and whatever the gore and its seams take up must be allowed in front, or else the coat will be too small there. This gore gives more roundness of breast and consequently a longer roll.

However, it should be borne in mind that a longer roll of lapel should never be made wider on top; but, on the contrary, smaller. A large or long roll must be produced by roundness of the parts created by gores from some direction, and not by the width of the lapel. For this purpose, I will refer to the overcoat in Dia. X. If that overcoat is cut for a short roll, the small gore will produce a good lapel; but if the roll is to be longer, the width of the lapel must be reduced, not by reducing the front edge, but by enlarging the gore under the lapel. If the lapel is not reduced in width, the long roll will fall over too far toward the armhole, and no coat looks well with an extremely broad lapel on top. The width of the lapel depends on fashion, but all lapels should be wide enough to admit the button-hole and leave a reasonable space in front and back of it. It looks bad to see the button-hole too close to the front edge, or almost touching the seam behind.

According to the present style, a lapel should be 2 in. wide at the bottom, $2\frac{1}{2}$ in. in the middle, and from 2 to $2\frac{1}{4}$ on top; but there is no law against making it a trifle wider or smaller. But this work has nothing to do with fashion, and all fashionable points must be obtained from the regular reports of fashion.

Again, it will be noticed on the single-breasted coat, as shown in Dia. I, that the front of the forepart has a gore cut in its center at the waist seam but none above or under the lapel. There being no gore under the lapel to produce the oval form of the chest, the gore must be cut below, else the coat will swing off from the front of the body. The point of that gore must point to the center of the breast, and may run straight downward or may be turned somewhat backward. Whenever that gore is cut, the bottom of the forepart must be rounded on and along the bottom of the gore, or its sewing up will cause a kink at the waist seam.

The front edge of a vest must also be explained, although the different diagrams cannot fail to make the correct impression. In Dia. XIII, it will be noticed that in the front of the neck a small gore has been cut, which will bring the straight front line to the oval shape of the body. On a frock coat the larger gore toward the waist effects the same thing. On a vest the under arm cut is made where the gore in the frock coat is cut, and consequently the vest has that gore balanced in the side seam. A vest cut close up to the neck and without collar would not look well to have a gore cut in front of the neck, and so the deduction is made in front by starting the front edge about $3\frac{1}{4}$ numbers from the point of 135 deg., and on the plumb line, and meeting the front line again at line 9. On a double-breasted vest, which is intended to button all the way up to the neck, and lap over to the other side, this gore must be cut, not where it is marked in Dia. XIII, but in a cut forming the lapel, and which cut should be as large as the gore shown in Dia. II. It is impossible to make a double-breasted garment of any kind without that large gore if it is intended to fit the form when buttoned over. It is true, very few vests of that

kind are made; but that kind of a cut must be made in all double-breasted garments if a well-fitting front is to be obtained when buttoned up.

From line 9 to line 15 the front line is the front edge of a single-breasted vest, receding a trifle at the lower button. Very few vests are cut all the way up to the neck, and consequently the gore at the neck, as in Dia. XIII, is entirely cut away and of no account. Single-breasted vests that button up, say to about 2 in. above line 9, can be fitted without any gore; but the front edge should be worked so that it will not stretch out in making, particularly around the open neck. Low-cut vests, and without turn-down collars, must be fairly well drawn in at the open neck, or the long opening will gape more or less. Single-breasted as well as double-breasted vests with a low opening should have half an inch gore cut under the collar. The gap may be taken away by drawing the neck in with a thread or stay; but a gore is better—the maker should know just what to do with it. Stretching the collar will never do any good—it will give the collar a different shape, but will never bring a gaping front to the body.

In producing a double-breasted vest, 1 to $1\frac{1}{2}$ in. may be added to the front edge, and the buttons set back that much from the place where they would be if the vest were single-breasted. To obtain the proper balance for the bottom of the double-breasted vest along the buttons, so that both sides meet, sweep from $3\frac{3}{4}$ at the plumb base line on Dia. IV through the bottom of the front part of the angle of 15 deg., or as far backward as the buttons will be located. This is a sure sweep. (See Dia. IV.)

Besides the gore under the collar, or the drawing in of the edge around the neck of a double-breasted vest, I have found in a majority of cases that it is well to lengthen the back, say $\frac{1}{2}$ inch—which gives the front a better opportunity to settle in its place. It is ten times better to have the back of a vest a trifle too long than too short. The difference between a vest and a coat may well be observed from Dia. I, II and IV. It is useless to describe them, and I will conclude this article with the following remarks:

A coat must fit best behind and at the shoulders, for the front can be regulated by moving the buttons, and for this reason a center line in front is not important; but it is very handy to have one for a system, whenever you want a straight front.

A vest is intended to fit best in front, and for this reason the front is cut loose at the front of the waist. The vest is cut off a few inches below the waist, and a trifle loose cloth will not show; but if a coat were cut as loose there the skirt below would flare in all directions. To regulate the top button of a coat and vest, so that the coat will cover the vest when buttoned, place the top button-hole, say on line 9 for the coat, and $\frac{1}{2}$ in. lower for the vest. The single-breasted coat has one inch more cloth there, and the button may be set back one inch on the coat, and on the vest as near as the button-holes when buttoned. The coat will cover the vest about one inch, and this may be used as a guide whenever the opening of the coat and vest are lowered.

To the center of the front also belongs the lapel, and a cutter should know just how much to use for that purpose, and with that object in view examine the front of a clergyman's coat as shown in Dia. I. A coat of this kind is, of course, without turnover or lapel, but it must be loose, though not too wide; and if it is correct that the angle of 135 deg. makes the top of the front just large enough to sew it up with a seam, providing a large gore is cut below at the waist, then it follows that the buttons and front of the button-holes must be sewed one seam back of that line, and enough cloth left in front of the base as is required in front of the button-holes and in front of the buttons. If the edge is bound half an inch on the button-hole side and one inch on the button side it will answer very well; but if the edge is turned in one more seam must be allowed. The space in front of the button-holes should not be less than five-eighths inches and may be three-fourths, and the button side may have one-half an inch more for extra lap.

Now, I will refer to Dia. III and XII. Observe the circle which is drawn from 60 degs. on the right and through 135 degs., which circle gives as good a top to the lapel as anything that can be contrived, and the whole front produces an extreme cut-away. If the lapel is to be run further down, all we find necessary to do is to allow on the bottom of the lapel, say three-fourths inches, and shape the upper part according to notion. If we desire a long roll of the lapel, a gore should be cut under the lapel, and the gore and seam again allowed in front, so that the original width of the circle and on top of the lapels, is not destroyed. There is no question but that a larger lapel requires a trifle more width around the second or third button-hole, but how much must always depend upon the notions of the cutter; but in all cases the lapel of a single-breasted coat should be large enough to allow the second or third button-hole, or all, to be made without coming in the break of the roll, and a neat lapel need

never be larger than for that purpose, no matter how low it is to roll. It is here where the touches of a fancy cutter can be seen, and a cutter has always a chance to become more proficient on that point. Even with the greatest care he may often obtain a lapel that does not suit him. But the cutter alone can not do all. The journeyman must have the taste and the ability to make it so that it will not only suit the cutter, but will also be admired by the public.

If the front of Dia. I was to be sewed together with a seam like the back, the front line of the angle of 135 degs. would have to be cut through, and that would fit down to between lines 15 and $17\frac{1}{2}$, but below that point the front would have to be reduced 15 degs., and at the same time where the front requires reduction, the back requires an addition, all of which is shown in Dia. I.

There is one more important point to be considered in connection with the center of front and back, and this is the length. For particular forms, or for odd forms, it may be measured as follows: From the top of back measure straight down behind, and again, from the top of back measure forward, striking point $11\frac{1}{4}$ on the plumb base line, as near as you can, and from that point go straight down to a level bottom for both back and front. To obtain that level bottom by the scale, make both back and front even long from the point of the angle of 135 degs. for a frock coat, after all seams are sewed.

For a sack coat, make the front about $\frac{3}{4}$ shorter than the back, for the reason that the back of a sack coat is also $\frac{3}{4}$ shorter than that of a frock coat, and which is fully illustrated by the lap of the bottom of the sidepiece and top of skirt in Dia. III. This calculation holds good for the normal form, and for the long or for the short neck, but for the stooping and for the erect form it ought to be measured, especially in extreme cases.

THE WAIST SEAM AND BOTTOM.

IT cannot be supposed that all seams of a coat will run according to the slope of the body when a pattern is laid on the flat table. The run of the seams, when covering the crooked form of a man, must always assume a different position when laid out on a flat surface, which is fully demonstrated in the back slope of pants. But a cutter should know how much they are out of gear from a certain line or base. If a cutter is able to cut a frock coat with a waist seam running horizontally around the body when the coat is on, then it will be easy for him to produce a square bottom, which is always in good style, and a coat that is too long or too short at one place is always a misfit. On the contrary, a horizontal waist seam is not in good taste. A stylish waist seam is on a gentle curve upward at the side when the coat is upon the body.

Taking the side as a guide, the back may be $\frac{1}{2}$ in. lower, and the front may be 1 in. lower. But the position of the human form is so different in different individuals that we can seldom find two men recording the same position of the waist seam when having the same coat on. This being the case, a cutter should come as near to it as possible. The true position of the bottom of a coat, or of the run of the waist seam, can best be found by measuring with a straight-edge from the level floor upward. The position of that seam, as shown in Dia. II, may be considered as a fashionable run, but there is no law to prevent us from curving it more or less.

As shown in Dia. III, it will be noticed that $\frac{3}{4}$ length of the back is absorbed by the lap of the top of the skirt and bottom of side piece, and consequently the front must also be shortened that amount, at the bottom from the side forward, in order to make it square. On the sack coat the back and side piece are in the same position, and consequently the bottom is square. The shaving off of the front of the skirt for cutaways has nothing to do with the foregoing calculation.

So far I have paid attention mostly to straight fronts, because they must be cut just right, for a straight front coat will be spoiled if the bottom of the skirt laps over too much or hangs apart. In cutaway coats no such trouble exists, but it is necessary to observe the following difference between a cutaway and a straight front. A straight front is usually a longer coat than a cutaway. A longer coat is required to have a fuller skirt toward the bottom, so that, in walking, the legs can have play enough and yet not strike the coat with every step; and the longer the coat the more space is required. A cutaway coat is always a short coat, but a short coat may also have a straight front.

Now, a short coat should have its skirt so arranged that it will close in well to the body and not flare in all directions; and for this purpose I refer to Dia. III, which front is the proper shape for a regular cutaway, as well as for a dress coat. Below the gore, in the center of the forepart, the upper seam just laps over the skirt enough to straighten the seam when the gore is sewed up. The gore itself would naturally run straight downward, but it is turned at the waist seam and run forward into the skirt seam, which will take away all surplus flare at the side of the skirt. The connection of the top of the skirt and side piece is the same for all coats. All must hang the same (straight down at the back), and all changes between the full skirt and cutaway are made from the under arm cut, forward.

A very good way to change the full skirt of Dia. II to that of a cutaway is as follows: Cut the skirt pattern like Dia. II, then from the under arm cut downward, fold up the pattern, say $1\frac{1}{4}$ in. at line 30. The side piece and skirt remain stationary. The fold is brought from the top of the front, and the top of the front of the skirt is changed to the shape of Dia. III. All frock coats should fall straight downward from the seat, whether long or short, and for this purpose I have made the backs the same on both cutaways and straight fronts, both leaving perfect connection between the bottom of the side piece and the top of the back skirt, except Dia. III, which is produced for a different purpose.

All changes in the spring toward the bottom of a coat must be made by reducing the lap between the forepart and the skirt from the side seam forward. Dia. II may be considered to have enough spring for a full flowing skirt of the present style, while the cutaway may be made even at the front, but so that the top of the skirt and the bottom of the forepart run on a gentle curve, after the gore in the forepart is sewed up. That part of the waist seam of a cutaway should be cut like Dia. III, that is, a lap of about $\frac{3}{8}$ at the gore upward, and even again in front. Dia. III is made with a gore in the front of the waist seam, but that gore is calculated for a dress coat skirt, which requires the skirt to close in pretty well when the coat is on, and is good for all extreme cutaways. In the production of a dress coat it will again be found handy to have the coat and vest on the same base, because it looks horrid to see such a coat front shorter than the vest.

The back, and the fold between the back and the front skirt, and all over and below the side piece, must be the same on all coats, that is, all must hang straight down. But after all, the back skirt of a cutaway may be cut closer than the skirt in Dia. II, for the reason that a short cutaway cut seant at the bottom of the back skirt will not go apart as easily as it would do if cut, say 10 in. longer.

Dia. II gives a good representation of the run of the bottom, and the lap at the waist seam shows 1 number extra length for the curve of the chest. The skirt of any double-breasted frock coat should be cut so that when done and the front laps over, both the waist seam and the bottom meet.

Now, providing the lengths are all well calculated, it becomes simple to make these points meet, and it is done as follows: In front of the plumb base line make the skirt even length and shape in all respects like Dia. II. From the under arm cut forward, sink the forepart waist seam $1\frac{1}{2}$ at the plumb base line and the same at the front edge. At the bottom drop the front of the skirt about $\frac{3}{8}$ to $\frac{1}{2}$. The bottom of the back is $\frac{1}{4}$ longer at the side than it is behind, or at right angles with the center line of the center of the back. At line 30 the center of the back is thrown out 1 number and that much is again reduced at the side of the back, as a gore. Throwing outside 1 in. and cutting 1 in. away at the side produces the oval shape over the seat. If the center of the back was placed at the base and the sides made even from line 25 down, then the whole back part would appear flat.

The under arm cuts in Dias. II and IV, are based upon the difference of the diameter of the body from side to side, close under the arm and at the hollow of the waist. The diameter of the normal male form may be considered to measure one inch less at the waist than at the chest, both backward and forward and sidewise, and the circumference of such a body may be computed as being one-ninth less waist than the breast on the whole measure, as 36 breast and 32 waist.

Now, it should be observed that Dia. II and Dia. IV are laid out in different squares, and that if Dia. IV were laid out in the same square as is Dia. II, the gore under the arm would be $3\frac{1}{4}$ at the waist, as it is on Dia. XII. When I say above, that all coats and vests have the under arm cut calculated according to the difference of the diameter of the waist from side to side, I mean a coat laid out as shown in Dias. II and XII, and a vest as laid out as shown in Dias. IV and XI. Each requires about one inch reduction at the waist and at the under arm cut. The coat is simply that much larger over the hips, as the swing of the side piece from a square of 20 to a square of $17\frac{1}{2}$ amounts to.

The square of 18, for either a three-seamed sack, or a frock coat, may be reduced at the waist as shown in Dia. II, and if the diameter of the waist indicates that more space is required at the side, it should be allowed according to that indication. Some men are quite well filled out in the sides of the body and flat in front, while others require more waist proportion in front. The waist proportion on a frock coat cannot be made according to the close measure taken over the vest, but must be made according to the measure over a well-fitting coat when buttoned up, and to be taken as large and as loose, yet as snug, as the coat really requires it to be. Some may call this an actual measure, and some may contend that this measure cannot be taken correctly, but, be that as it may, nevertheless it is a measure, which gives an indication of what is wanted, and also a truer indication than a measure taken tightly over the waist. By the waist measure, I mean the measure at the hollow of the waist and not the waist seam of a frock coat. The hollow of the waist is a permanent point on every human body, but the waist seam changes according to style or notion; and the width of that seam should come pretty near to the actual measure taken over the coat when buttoned up.

In order to observe the difference of the location of waist proportion, let us consider Dia. I, which is laid out in the same position as a vest, although the square is $\frac{1}{2}$ larger. Here we find a reduction of $\frac{3}{4}$ at the hollow of the back, or between the sidepiece and back; and on line 20 we find a spring of $\frac{3}{4}$ at the waist seam between the front and sidepiece.

The normal form requires a reduction of 1 in. at the under arm cut, on a vest, and about ½ in front, which ½ is again thrown out behind as a spring over the seat; and which is not waist reduction or waist addition, but must be considered as something to conform with the turn of the body from the pit of the stomach downward and from the hollow of the waist in the back downward. This cut under the arm on a square of 20 is a natural gore for a vest, while for a coat the same spot requires a spring, which is also a natural one for a coat, and both are in their place because the nature of the garment requires it, not the body itself. There are men with quite small and tapering waists, and for such the underarm cut must be made larger, while others with very full waists spread sidewise and require the under arm cut smaller—or no cut at all but a spring.

Now, in making our calculation for the waist proportion according to diameter of the body, the following must be observed: If the full diameter of the waist, from side to side, is 1 in. less than that of the chest from side to side and under the arm, it will throw ½ inch taper on each side; but the diameter covers the double body, and the double garment, or one front and one back on each side, consequently each half back and each half front requires a taper, or a reduction of ¼ inch, and for this reason the vest, as a garment cut close to the body, has a reduction of 1 in. under the arm, and which 1 in. is to be taken away on the forepart as being the best shape.

On a vest, I find that all waist allowances may be divided between the side and front with very satisfactory results, but extremes should have a trifle more in front than at the side. On a coat, the most of waist allowances should be at the side, because surplus cloth at the front of a coat will produce too much skirt below, while on a vest it will not show, because the vest is cut off or ends a few inches below the waist.

The cut between the sidepiece and back of a frock coat should never be changed for waist proportion. This cut is not made or calculated according to waist proportion, but is made for convenient cutting. However, this must be observed: Short men require the waist higher up than the scale produces, and in consequence the hollow, or the turn of the sidepiece, should be where the hollow of the waist actually is, and not at line 17½, as shown in Dia. II. Therefore just the contrary must be observed on tall and slender persons. I find that the difference of the length of the waist between short and tall persons is about this: If the style allows the waist seam to be located at line 20 for the normal form, then a short person may have that seam at 19 and a tall one at 21, while the hollow of the waist is 2½ higher, all of which can be measured on each customer.

LARGE WAISTS AND THE NORMAL FORM.

THIS article includes all sizes, from the smallest child to the largest man, and is to be applied on all forms whose whole waist measure is more than one-ninth part less than breast. When a child is born its waist is larger than its breast. The normal growth of the waist is a constant reduction of its relative proportion to the breast, until we may find, at the age of 20, a waist of about four inches less than breast. After that age the waist has a tendency to become larger again, more or less, until we again find some individuals with the same waist proportion as when they were born.

Now, is not a child with its waist larger than its breast, of normal proportion? Is not a man who measures 48 breast and 50 waist, of normal proportion? The present conception of a normal form, as being four inches less waist than breast, is wrong. This proportion is found in the medium sizes, as 36 breast and 32 waist but it can be called a normal form for that size only. We may find 44 breast and 40 waist, but they are exceptions, though I have found one 43 breast and 37 waist. The child of 24 breast and 20 waist is not to be found; consequently the normality of the proportion of four inches less waist than breast is a myth as far as cutting garments is concerned, and cutters must make calculations for each individual customer; or, as in cutting for ready made clothing, the different sizes must be classified according to their normal conditions

But taking 36 breast and 32 waist as normal for that size, we find also that it means a waist which is one-ninth part less than the breast, and if we make a diagram to fit that size and enlarge it to size 54, it will fit a waist one-ninth less than that breast, or a waist of 48; but such forms are not in existence as far as I know. If we diminish it to breast size 27, it will fit a waist of 24, which may come pretty near to a great many boys of that size; but the great majority of that size have fuller waists, and the younger the child is the larger its waist proportion will be found to be.

But before we proceed further, remember that in trying to fit coats in the back according to the waist proportion, more garments are spoiled than made better; for, in the first place, the smallness of the back part of a coat does not depend on waist proportion at all, as shown elsewhere. The hollow of the waist behind is not to be fitted at all, but passed over; and its proportion is of no account until it is almost as large as the breast. Breast 40 and waist 37 requires no addition to the waist.

Breast 42 and waist 45 (with seat 45) I find I can fit very well by omitting the gore under the arm, and in place of the gore lapping the side piece and front $\frac{3}{4}$ in. at the waist seam, and adding $1\frac{1}{4}$ in front, which will allow 3 in. extra width for a waist that is 6 in. out of proportion on the whole. And it is further accounted for as follows: The 1 in. omitted gore and the $\frac{3}{4}$ lap makes $1\frac{3}{4}$, and the $1\frac{1}{4}$ in front make 3 in. in all, or only one-half of the actual measure, which may appear as too small, but we must consider that the hollow of the waist for the normal form is not to be fitted but passed over, and a larger waist will fill it out better, that is all. To obtain a correct waist proportion on a coat is quite a trick, and cannot be learned from the books; and a cutter must consider each customer well. A correct waist measure may be taken over a well fitting coat when buttoned up, and the coat made precisely like that measure—all seams and lap for buttons and button holes to be taken into consideration.

One thing should be observed: The front angle of 15 deg. is 5 numbers wide at line 20, where the waist seam is located. But on a large form the waist is higher up, say at line 18, and the width of the front angle (as 5 at 20) must be re-established at, say 18; that is, we must go outside of the front line of 15 deg. The same thing ought to be done at the side, and the lap of $\frac{3}{4}$ made at the waist seam and not at line 20. Line $17\frac{1}{2}$ is established for the hollow of the waist, and line 15 as the turning point of the body in front. Line 20 as indicated is for the top of the hips, and the waist seam for a frock coat regardless of style or fashion.

But on corpulent men, these lines stand too far down, and on slim persons they are too far up; consequently, these lengths must be measured, and as the waist seam runs at right angles with the back, as on a square of $17\frac{1}{2}$, and as a point for line 20, take the outside of the elbow, and for line $17\frac{1}{2}$ take the inside of the elbow. The elbows

are a sure guide, for they always fit into the hollow of the waist, and no man can strike both of his hip bones with both of his elbows at the same time. As a general rule, I claim that the angle of 135 deg. will cover every form of large waists, providing the sides and the shoulders fit. Every cutter can try this by cutting the double angle of 135 deg., neck and all, and put it on as a cape by closing it in front. To imitate the large waist simply lift the front edge forward—and notice the result. Or it may also be tried on a corpulent form, when it will be found that the angle of 135 deg. will cover it. A piece of pattern paper will do for that purpose, or even a piece of muslin. But coats are not made from sheet iron, and if otherwise well balanced can stand a great deal of abuse at some places. Therefore, no cutter will fail if he divides the extra waist proportion intended to be allowed into three equal parts and place two parts at the side and one part in front, starting all at the armseye lines.

On coats all allowances should be scant in front, because plenty allowance there would throw too much skirt in front. A vest is cut off a few inches below the turn of the body a trifle more will not show, and may be balanced again by cutting a gore in the middle of the forepart below the pockets, particularly if the abdomen turns very abruptly. A vest is better $\frac{1}{2}$ in. too large in the front of the waist than that much too small.

On a frock coat, extra waist proportion can be given by dividing it all over the front and side of the forepart; but on a three-seamed sack the side seam is too far behind to be of much help. And it is best to enlarge the square of 18 numbers to the amount of waist proportion required, and reduce it again by a cut under the arm upward, as a five-seamed, for both under and overcoats.

Breast 48 and waist 50 can be fitted by enlarging the square from 1 to $1\frac{1}{4}$ in.—1 in. often yields excellent results. But by enlarging the square for any purpose, we ought to consider this: If we enlarge the square 1 in., point $13\frac{1}{2}$, as on a sack, and on line 9 in front will sink down $\frac{1}{4}$ of the 1 in., which will make the back that much shorter on line $11\frac{1}{4}$. This is very little, but it ought to be known to the cutter that a short back is always better for a large waisted form than a long back. (See Dia X.) Bear in mind that an under coat for a large waisted form is about the same thing as an overcoat that fits the normal form.

There is always a class of men found who complain that they seldom have a coat large enough in the armholes, unless the coat is too large all over. Such persons are usually well filled up at the side of waist and hips, and require their coats large there, and if this is not done, the sewed up back cannot give, and consequently the coat must give in front, and the whole of it is drawn backward, taking the armhole with it, and striking the front of the arm, while the back of the armhole shows too much cloth. A coat which swings loose at the back and around the side of the waist will never cut the front of the arm; it may be small all around the armhole, but it will only feel close and will not saw on one spot only.

STOOPING FORMS.

SEE DIA. IX.

STOOPING forms have so many variations that it is impossible to describe them all. The term "stooping" is generally applied to persons with prominent shoulder blades. We find them combined with long and short necks, large and small waists, hollow or flat in the back and front of the waist, and arms thrown backward or forward. All of these conditions must be observed and separately calculated, and a cutter will be kept constantly busy and on the watch. It is only where a cutter is thoroughly acquainted with the workings of this system of bases that he will be able to fit all forms as near as he is expected to do. All kinds of measures have been devised, and all sorts of imaginary bases have been adopted to fit the forms of a man; but where one cutter succeeds with a certain appliance, others utterly fail. The fact is, even if all measures should give the correct amount, the body itself could not be fitted except on a few specified points, and all defects should be covered up in place of imitating them. To fit the stooping form in all its details would result in a misfit from the start, particularly when the back of the waist is very hollow.

If we take a coat that fits a normal form, and put it on a stooping form of the same size, and button it under the chin, the neck will fit, but will stick out behind at the waist and spread apart in front. A reasonable way of altering it is to reduce the back seam of the side piece from the blade down, which will produce more curve over the blade and give more length to the back; and what is taken off behind at the waist is allowed in front. It is generally taken for granted that a stooping form requires his armholes more forward, but this is not always the case, for some of them throw their arms backward; and we find the contrary in a great many erect forms, who throw their arms forward—all of which the cutter must observe.

Now, suppose we permit the coat to be loose under the chin, and button one or two lower buttons. In this case we shall find that the coat will fit in the back of the waist, but at the neck it will be too loose and will gape all around the front. If we gather the wrinkles together in front we can make the breast fit the form, although the top of the back may be too short. So we can make our alteration on the spot again, always providing, however, that we are altering the pattern only, by starting at the front sleeve nick and laying a fold forward to the amount of whatever the fullness of the coat may indicate. This again will alter the pattern from that direction. It makes the front shorter in place of making the back longer. This last is the most reasonable way to alter a coat for the stooping form, for it must be remembered that in both erect and stooping forms the change proceeds from front to back, and at the waist.

The backbone is solid, although it bends, but it never becomes longer or shorter on the same form. If the body throws itself forward into a stooping position, the back bends and the front contracts at the pit of the stomach. If the body throws itself upward in a more erect position, the back bends the other way and the front expands at the pit of the stomach. The front only expands or contracts at the pit of the stomach. The backbone must be considered a hinge on which the whole body swings, just like a door on its hinges; and all alteration may be made from that point, either by stretching some parts or by folding up the pattern before the garment is cut.

If a stooping form throws his arms forward, then the armholes must be further forward of the front sleeve base. But in that case the front sleeve base must be just as much advanced. And again: Whatever the front of the armhole has been advanced must be added to the back of the armhole, for a stooping form has no larger arm than an erect form. The armhole must be moved forward, but made no larger.

This constant backward and forward movement of the neck, waist, and shoulders is one of the greatest studies any cutter will be obliged to go through, as it is, in fact, the only variation to be found in the normal form which cannot be measured, but must be taken by the trained eye of the cutter, and his practical knowledge of how to alter. Actual measurement by whatever measure or name it may be called, is a delusion, for all so-called long or

short measures around the shoulders, neck and arms must be taken close over a body which we do not intend to fit as snugly as the measure itself. As a rule, said measures are seldom applied, or transferred to a flat pattern on the same line as they have been taken over the form itself.

For illustration, we will examine the so-called upper shoulder measure, from the top of the center of the back to around under the arm and back again to the place of beginning. Said measure is always to be taken close, because any slack would again cause great variation in the hands of different cutters. By taking it close the tape will not strike the body of the coat under the arm at all, because the armhole is lower than the body itself, but the tape pulls the sleeve up and passes above the armhole. If cutters will go to the trouble and make a line on their patterns over which they transfer that measure, and then draw stitches in, they will find that when the coat is on the body they cannot even follow said stitches with the tape line, unless it is fastened every *few inches.* If that be the case, *what good is the measure?* If that measure is to do a cutter any good he must be able to follow a certain trail on the pattern, as he does on the coat when on the body, but that cannot be done. There is no one so blind as he who does not want to see.

If the pit of the stomach contracts or expands, that is no proof that the shoulder and arms also draw out of their normal position. If the breast measure be taken correctly, as directed in this work, passing over the point of the shoulder blades, then the round shoulders of a stooping form and the flat ones of an erect form are included within the measure. Consequently nothing can be added to the blade for a round back nor taken away for a flat back—the change must be above or below, notwithstanding the appearance of Dia. H B. The round back requires his armhole more forward, and what is taken out in front of the armhole is again allowed on the back, making the back broader. If the back of the armhole is not supplied with what is taken out in front, the under and back sleeve will drag and pull backward. Because the stooping form may throw his arm forward, is no indication that his arms becomes larger, but it demonstrates that his armhole must be located more forward.

But again: Because a man is stooping is no indication that his back must be round. A man may throw his neck downward in front, but may also throw his arms backward, and stand very erect in the waist. Such a form requires his neck hole downward in front but does not require his armhole forward. The front and back of the armhole may be located as for the normal form, or even for the erect form.

Further: Because a man is classed among the erect forms is no proof that his back must be flat. We find plenty of so-called erect forms who throw their arms forward, and their backs become very straight in length.

The terms *normal*, *stooping* and *erect* are very indefinite, and I do not believe that any man is, or ever will be able to describe a stooping form alone in all its variations and combinations. All that can be done is to point out certain forms; and the cutter who starts out on his cutting tour through life must always be on his guard, and study his customers, and imprint their forms upon his own brain.

Now, as the breast measure contains the full size of a round as well as a flat shoulder blade, we must come to the following conclusion. That the stooping form requires simply more length in the back, or less length over the front, and years of experience teaches me that $\frac{1}{2}$ to $\frac{3}{4}$ extra length over the blade is enough for the extreme stooping form, but such a form requires its length in the center of the back, or from the blade upward; and whatever the back is made longer on top must be shortened at the front, as is shown in Dia. IX, which illustrates the long as well as the short neck, and also the stooping form.

But there is no law to prevent a cutter from adopting a middle way, by leaving the forepart as it is and to make the whole back, say $\frac{1}{2}$ longer and reducing that length again somewhere at the armhole, because a back that becomes longer behind requires no extra length at the side. This alteration is even to altering the back as for a long neck, leaving the front as it is for the normal form. If a coat fit at the neck but swings off at the waist, reduce the back of the side piece, say $\frac{1}{4}$ in., at the waist and stretch it downward to make it again long enough—all of which is required to lengthen the back $\frac{1}{2}$ in. But if the stooping form should require his armhole further forward, $\frac{1}{4}$ is enough for the extreme. Point 8 remains the center for the back sleeve, all extra length being allowed on top.

In the conclusion of this article, I will say that I have given different views as to the making of alterations, because while cutting we can alter as we please; but if a garment must be altered after it is made, it must be altered as best we can, and if a garment is worth altering at all it is worth altering right. I will here again point to the fact that coats for stooping forms usually have a tendency to swing off at the back of the waist, and such garments can most always be brought to the body by giving the center of the back and the back seam of the side piece a good stretching under the smoothing iron from a point over the shoulder blade downward.

All alterations between the stooping and the erect forms can be better comprehended if we consider a well-fitting coat on a normal form as follows: Consider the coat cut through from each side to each back, and to each front, and consider the sides as on hinges, and then consider what the result would be if the form imitates the so-called erect or stooping positions. In that case the cuts across the hollow of the waist would open in front or back, as the case may be, and contract at the opposite. The result of the backward and forward moving of the body must be imitated by contracting or folding the pattern, just as a coat will full up in the back when the body becomes erect. Under the head of stooping forms also belongs the so-called "hunchback," and to fit such forms will always be a hard job.

To fit them is not the right term in my opinion. They do not want to be fitted, for to fit them would just show their deformity, which should be hidden by his coat, at least in the back of the waist. Such forms are often very erect ones, and most of them throw their arms and shoulders up, making them extra square, and may be at right angles with the side of the neck. If the armhole is left, as for the normal form, as it should be, then the angle of 135 deg. must have a gore cut at the neck, and in the shoulder seam, of at least 1 in., and the top of the back placed say 1 in. lower, and the front of the neck 1 in. lower, while the side of the neck may be widened $\frac{1}{2}$ in. only. This will not disturb the armhole and sleeve. The top of back and the top of front must be shortened, because there is no slope of the neck; the cloth runs straight over, and for this reason the side of the neck is to be cut out more, while there is no change whatever at the armhole.

Now, while the upper part of the back must be made shorter, that part of the back which passes over the shoulder blades and which is in this case extremely large, must be made longer, as far over as the enlarged shoulder blade requires it. But at the armhole the back requires the normal length only. On a frock coat such length may be given in the back, and that length again reduced by a larger gore between the side piece and the back. But on a sack coat this cannot be done, as no seam runs over to that point, and in consequence the extra length must be put in otherwise, and I will here give the best way to do it, but it may not be the shortest way.

If the back requires say $1\frac{1}{2}$ in. extra length over the haunch, cut the whole back $\frac{3}{4}$ longer in the portion of the back armhole, and reduce $\frac{3}{4}$ at the shoulder seam toward the armhole again, which will leave the balance of the armhole as it was before. Next, stretch the center of the back $\frac{3}{4}$ over and along the shoulder blade, and over toward the arm, say about 4 to 5 in. each way, or as far over as the enlarged shoulder blade requires it.

In the article on "Center of Back and Front," it is shown why the center of the back can be fitted on straight lines, and this is true of the back of a hunchback, though a modification may be made for such a form and some taken off above or below the hunch, or something be thrown out over the center behind. But it is not width, that such a coat wants; it is length over the blade, not over and clear across to the armhole, but only as far over as the deformation requires. In this respect let me allude to an article and diagram in "THE AMERICAN TAILOR AND CUTTER" of August, 1890, pages 34 and 35:

"That pivot, from the armhole across to the center of back, which must be done on straight lines, can not work, unless the body of a man is first pressed flat from side to side, leaving the center of front and the center of back on a sharp edge, or what would be the same illustration: on a form cut from a one-half inch board, the sides being flat. In this case only, the form can be fitted from back to front, and on curved back and front centers. But as long as we must fit men having the present form the back must be fitted from back to side and on straight lines at the center of back. The opening of the lines over the back, as shown in that illustration, is too straight, it will make the back either too long at the center, or too short at the middle of the back, and may fall smooth over the middle of the back, but will draw at the center and at the armhole."

The above should receive the attention of every cutter, as the term "Hunchback" is simply a combination of extremely stooping and extremely erect forms.

To sum up the whole stooping form: The back of such a form does not become longer, but it bends and produces a larger curve over the blade, and consequently the coat back will go with the body and requires no extra length. But the front contracts either all over the chest or at the pit of the stomach, and the coat must be contracted or shortened there, but as there is no seam there we must fall on to the next best place where we can find a seam, and here we find the shoulder seam in which the surplus length of the forepart may be taken up. Now, if we use Dia. II or Dia. VIII as a model, we simply lap the shoulders toward the blade, the same as for the normal form, but omit the lap toward the neck. This is the most reasonable way of altering for the stooping form.

ERECT FORMS.

(SEE DIA. VIII a.)

ALTHOUGH I have said that the backbone never gets longer or shorter in the same form, we find that whenever a body assumes the position of an over-erect form the direct distance from the blade to the seat becomes shorter, and the hollow of the waist becomes deeper and consequently longer. This can be noticed by anyone who will take the trouble to make the experiment. Take any form with a well-fitting coat and let him assume the stooping position, and the alteration for it may be found correct as described in the preceding article. Now let the same form throw himself in an over-erect position, and see the result. As the front of the pit of the stomach opens and becomes longer, it will pull the front of the coat upward. If we cut the waist through in front and sidewise, this cut will fall apart in front and at the side, and the back will set smoothly.

But we cannot cut the coat through, and so we must resort to artificial means, as follows: While the body thus expands in front, and the coat cannot follow suit unless cut through, the back of the coat will contract, starting at the side and at the most hollow part of the waist, and running backward. If we take a few pins and fasten up that surplus cloth at the hollow of the back, starting with nothing at the sides, we can readily ascertain the amount of alteration required, and fold up our pattern accordingly.

On a frock coat said fold is over the entire sidepiece, not at the waist seam, but at the most hollow part, or at and above line 17½. If it were lower it could be taken out in the waist seam. This fold, if laid in the pattern, will produce a sharp turn of the back part of the sidepiece and must be straightened by giving more width along that kink. The same is to be done on a sack. If the sack is a three-seamed one, the pattern must be cut through under the arm upward, the fold laid across the hollow of the waist, and seams allowed again in the opening, which may be an inch at the armhole; but what is not used for seams should not be cut away, but used as an outlet, which will sometimes be found quite handy. See Dia. VIII a.

It is true, we can alter such a coat by reducing it somewhere at and behind and below the arm, and by cutting the armhole forward, so that the back of the waist can fall backward; but it will take all the life out of a fit in the back, and make the breast too small. The only remedy is an outlet under the arm on a frock coat, or in the center of the back, or in the side seam on a sack. By this operation it will be seen that the erect form cannot be fitted by carving out the waist behind, but must be done by contracting the length, and really giving more width. One-half to five-eighths inches fold may be set down as the average, but the exact amount cannot be found by measuring. All this depends upon the judgment of the cutter. One-half to one-fourth inch, one way or the other, will not spoil a coat if otherwise well-balanced.

Stretching certain parts will accomplish a great deal of good, but all stretching should be clearly marked by nicks, for a journeyman cannot always be expected to know just where the stretching is required. Thus, if we take a regular frock coat pattern, and stretch the sidepiece half an inch downward on the front and at the hollow of the waist, that is equal to contracting the sidepiece the same distance at the back seam; and the erect form is imitated.

The erect form requires the coat short at the hollow of the waist, but the stooping form requires the coat longer over the shoulder blade. Erect forms may be fitted by simply taking, say one half inch, from the curve of the sidepieee, starting at the hollow of the waist, as shown on Dia. II B, and the contrary may be applied to stooping forms. To fit the back of the waist for either the erect or for the stooping form, and taking Dia. II as a model, we must in some way give more spring for the erect form, and less for the stooping form. Stretching the bottom of the sidepiece is equal to giving more spring on either side, and it is better, because the extra width so obtained will divide better

all over the hip. But it would not do to adopt the contrary plan for the stooping form, and shrink the bottom of the sidepiece. The measure of the waist being the same, the back part of the waist requires a reduction, but which reduction on the back must be allowed in front. The reduction of the back part for the stooping form is best made by reducing, say one half inch, on the sidepiece and on the under arm gore, and by stretching the back sidepiece seam about three eighths downward on starting at line $11\frac{1}{4}$, which operation will leave the whole gore between the back and the sidepiece undisturbed.

I have seen a great many tailors shrinking the sidepiece in its center downward, but shrinking a straight piece will always come back to its original shape. To improve the shape of the sidepiece under the iron must be done by stretching its edges downward; the front seam for the erect and the back seam for the stooping form. After a coat is made up, and it should prove short over the blade by hanging loose at the back, the back may be made longer over the blade by stretching the front seam of the side piece upward, starting at the hollow of the waist. I say it may be so made longer, but the best way to treat such a back, is to give the whole back and the back part of the side seam a good stretch downward, over the blade, all of which holds good on a sack coat.

Many coats hang better after three months wear, simply because some parts have stretched, and can now conform to the shape of the body. It is always better to have a coat back a trifle short rather than too long. A short back can easily be stretched one half to five-eighths of an inch over the blade, say 3 to 4 inches sidewise from the center of the back, for which reason all back lining should be put in in ample quantity, both in length and width and on the bias. If, however, the lining is straight and not longer than the outside, then the lining must be opened and pieced, for it cannot be stretched.

A skeleton coat of woolen material will fit almost any form, for it will stretch wherever a strain may exist; for this reason all linings should be plenty large around the arm and back, and the whole coat should be made soft so that it will give. This includes even the basting of the linings on the seams, all of which should be made with large and loose back stitches.

In connection with this article and that on the "Stooping Forms," let us again compare the angle of 15 deg. If a cutter will go to the expense and trouble to cut and make for himself a skeleton coat, cut over Dia. III, omitting all seams sidewise, and for this reason reducing the square of 18 to 17, and using nothing in front and outside of the angle of 15 deg., in fact cutting nothing out except the armholes and the shoulder seams, and using some stiff material, such as heavy vest padding or French canvas, he will be able to form for himself a correct idea of the workings of the angle of 15 deg.; and it will repay him, for he may save many subsequent alterations. And alterations cost considerable money, besides a great deal of annoyance between employer, cutter and customer.

In cutting it, the back should be cut pretty short, say 13 on line 9 in front, or still shorter, in order to assure a smooth back. When such a skeleton is on the body it will be observed that the center of the back is on a plumb line from the shoulders down to over the seat and the bottom of the coat, and that at the side it tapers outward from under the arm to over the largest part at the thigh, and down to the end of the coat, but does not touch the hollow of the waist anywhere, running straight downward. In front it will taper outward but fit the whole chest above the pit of the stomach; below, it will taper forward and stick outward in front, as shown in Fig. II.

To reduce the front, means to reduce the front angle of 15 deg. so that it falls straight downward from the front of the waist the same as it does at the back of the seat, thus giving stepping room for the legs, backward and forward, as also shown in Fig. II. Elsewhere the *modus operandi* is fully explained.

Now, suppose this angle of 15 deg., as a completed coat, is upon the body, and without a wrinkle in the back as well as without any reduction at the hollow of the back of the waist, and let us—*contemplate the scene!* If we desire to bring the straight back into the hollow of the body at the side and back, we must do what we have done to bring the back of the pants in to the body, back and below the seat. We must cut the waist through, starting at the side and going all around the back, and over to the other side; and when thus cut through we can push the upper part in to the hollow of the waist. And it will be found that in so doing the upper portion becomes too wide for that circle around the body and must be reduced in width. At the same time the upper part becomes too short and a wedge must be put in, starting with nothing at the side and running backward; and the closer we try to fit the waist, the wider the wedge must be at the back, and the more the back must be reduced in width.

Dia. III demonstrates this fact by the shorter back, and by the reduction of the back of the sidepiece, and by the wedge between the bottom of the sidepiece and the top of the skirt. I do not claim that it is just so, by every fraction of an inch, but I know that Dia. III will produce a coat that will fit the normal form, and is the same as

Dia. II; and if anyone else would like to see it illustrated in a different way it would merely show that our ideas are running in different directions. But this would not change the principle.

Now, I will refer to the different effects produced if the wearer throws himself into a stooping or over-erect position when the garment is cut through at and across the hollow of the waist. By observing the backward and forward movements of the different forms, it cannot fail to show to the most critical observer that most all changes between the stooping and the erect form can be made by reducing the width and giving more length for the stooping, and by reducing length and giving more width for the erect form at the hollow of the waist; and no other change is required, unless a combination of abnormal conditions exits. The gore between the back and the sidepiece at the waist is an artificial gore, and should not be much changed for any form.

Most all changes between the stooping and erect forms may be made at the under arm seam, as follows: For the erect form, allow say $\frac{1}{2}$ to $\frac{3}{4}$ inches at the side, and before sewing that seam up stretch the sidepiece say $\frac{1}{4}$ to $\frac{3}{8}$ inches, which will shorten the back seam that much and throw the extra width behind where it belongs. For a stooping form, take off the same width at the side, and stretch the back seam of the sidepiece at, and just above, the hollow of the waist, but never enough to show the back full. The reason why I am opposed to changing much on the back seam of the sidepiece is, that that seam is always on a curve and it is very long, reaching clear down to the bottom of the coat, and is apt to be thrown clear out of gear by changing it. But the under arm cut is nearly straight, and short, and can better be managed. If a vest can be thrown in by that seam surely a frock coat can also. If the back is a trifle full at the sidepiece, and at the hollow of the waist, a coat will be made the better by it, and in no case should the back be stretched there. If the back requires shortening, it must be obtained by stretching the sidepiece on the forepart downward, or by folding up the pattern at the back of the sidepiece. The form of alteration depends upon the time it is to be made, either before the coat is cut, or after it is made.

To this article of erect forms may be added something about straight backs, at the neck, or from the shoulder blade upward. A long neck may lean forward and may then be classed among stooping forms, and must be stretched accordingly; that is, by lengthening the back only. But a long neck may shoot nearly straight up behind, in which case it must be classed among the erect forms.

Between a long neck leaning forward and a long neck shooting nearly straight up behind, there must be a difference in the shape of the top of the back. We all know that the top of the center of the back must be higher or at least as high as the side of the back, when the coat is on the body; still when the pattern is spread out on a flat surface, the neckhole is nearly a circle, and it will be a still more complete circle when the garment is on the body. It must run nearly in a circle because from the chest, shoulders and shoulder blades the body runs upward to a point, as shown in Fig. I, but the garments are cut off at the neck. The broader the top of the back is cut, the more center sinks down behind, as shown in Dia V.

Now, the cutting down of the top and center of back must be done, because we intend to cut the shoulder seam where fashion requires it should be. As far as the fit is concerned, we might run the shoulder seam to within $\frac{1}{2}$ in. of the center of back, in which case the center of the back would be the highest point. As backs are cut, the sides are the highest point on the flat table, but when on the body the center of back is the highest point, and we may just as well say that the top and center of back are the highest points, that this is the starting point, and that from this point the whole neckhole is thrown forward and downward, where it forms in a complete circle around the neck.

I am writing here about the neckhole proper, and not of the length of the back over the blade; and the above explanations are made to show that the so-called front shoulder point is anywhere we please to locate the shoulder seam, and again, I want to show that a straight back, or a straight neck behind, requires the top and center of back higher than a neck which leans forward.

Mr. J. B. West, in his "*Grand Edition*," page 30, claims that the principle alteration from a normal to a stooping form consists in raising the center of the top of back somewhere up to line A. I certainly will not dispute the merits of Mr. West, but I must say that, like all mortals, he made mistakes, and the above is a "*Grand Mistake*," especially when we read on page 5, that the problem he has worked on for fifteen years is now solved, and complete, and will stand without improvement, or alteration, as long as there is no change in the construction of the human form.

About thirty years have passed, and the human form has not changed, and still I claim, that the above alteration must be made in just a contrary way; that is, that the circle for the neckhole over the back must be more complete toward the center of back for a person who drops his neck downward and forward, and that the

erect form or the straight form on the back of neck requires the circle straightened over the center of back, and will here repeat, that on the angle of 135 deg. a neckhole can be cut and fitted with a complete circle as seen in Dia. XI and XII. That part of the circle which passes through the back, say 2½ in. wide, sinks about ⅜ at the center of back, and this part must be straighter behind for a straighter neck, and may be made entirely straight for extremely straight backs.

Quite straight backs are usually long necks, and for such the center of back must be raised, whereas a short straight neck would require the sides lowered. How much more or less all this may be, must depend upon the judgment of the cutter,, and as the whole thing turns within five-eighths of a number, a cutter cannot go far out of the way: but he should observe that a collar one half or even one quarter inch lower behind than at the sides, is a spoiled collar, and that a collar which is too high is easily cut down, but when it is too low it is hard to bring it up, unless there are outlets.

Some cutters may say that I am mentioning things which will do them no good, because they cannot go into all the details. This I admit, but others again will be glad to have a thing figured down, so that they need not bother their heads about it. But to illustrate: Let us suppose we have before us a round wooden pole 5 in. in diameter, representing the neck of a man. If we cut it straight through we can fit a collar to it with a square piece of cloth or paper. Such a square piece fits to the circumference of a pole, if wound around on horizontal lines. Next, let us suppose that we cut one end down, about 3 in., representing the forward and downward slope of the neck, and we find that a straight piece will not fit that slope, but must be hollowed out. Now, if we build shoulders to it, and a chest and shoulder blades, in fact take the form of a person for our model, we find that the neckhole of a garment goes around the top of a body sloping upward from all sides, though irregularly, but that a complete circle from the point of the angle of 135 deg. will fit the neck after 45 deg. have been taken out from its center, all of which will form an irregular circle or curve, while in any shape on the flat table; but will form an almost complete circle when sewed together and placed on the body. The neck itself is almost a complete circle, and the point of the angle of 135 deg. must be considered as the center of the neck, which is round, but to which cloth must be brought by irregular approaches. Now if we find a straight neck behind, with hardly any incline from the back forward, the garment must run straight up, too, and the circle for the neckhole must be straightened as far as the back goes; but if the neck slopes forward, the garment must turn forward also, and the edge of the circle over the back must form a more complete part of a circle.

But I must make another illustration: Take a piece of stiff paper, and cut out of it a half circle of say 4½ in. whole diameter, representing the neck of a 36 breast measure, or thereabouts. Take that circle and fit it to the neck of a man on horizontal lines, and the circle will fit the neck no matter where you apply it. Next try to fit it to the neck from the side, but on the slope of the shoulders, and the circle will be too round for the neck. Again, try to fit it from the slope of the back, and the difference between neck and circle will be still greater. Next, take a stove-pipe of 4½ in. diameter and try to fit it on that, and on perpendicular lines, and you will find that the circle cannot be used at all, but that a square piece must be used for that. If the neck were as wide as the shoulders, and the chest and the blades, that is, if the body would run straight up from these points, then the top edge could be fitted with nothing else but a square piece of cloth.

After all, the above pros and cons let me say that if Dia. II is used for the stooping form, place height of back ⅛ to ¼ higher, and reduce the back of the sidepiece ⅛ to ¼ more, at the waist, and that is about the best alteration which will result from the description of the stooping form. Contrary: Placing height of back at 14½, and giving ⅛ to ¼ more spring at the waist will give a good proportion for the erect form. As to the difference of 1¼ numbers more or less back length over the blade, between the stooping and erect form, each cutter must judge for himself, for it cannot be measured on the human form.

Short persons with short necks and very flat shoulder blades, may be fitted with a height of back of 14¼ above line 9, and top of back at 3¼ and side of neck at 4. (See Odd Forms I.) Erect forms who throw their arms backward can be fitted by using a pattern one or two sizes too small, and by allowing the difference of ½ to 1 inch, as the case may be, on the front of the breast. If a cutter will put a coat, say two sizes too small on such a form, he will find that the back, the shoulders and the armhole fit, but that the front of breast is too small, and the extra size must be allowed there. This rule will work both ways, and the contrary may be applied for stooping forms.

ODD FORMS.

DURING the summer of 1891, I reviewed such patterns which I had preserved for several years back, and I knew that they were good. I laid them out like Dia. II, IV, VIII, VIIIa and X, and they came as near together as could be expected, at least they came near enough so that a slight difference would make no difference in the fit, and I think I can give some valuable information if I give descriptions of some odd shaped garments, just as I found them.

I.—CUTAWAY FROCK COAT.

MODEL: DIA. II.

Breast, 40; Waist, 40; Hip, 41½; Seat, 40; Length of legs, 30. The seat measure and the length of legs are noted for the purpose of giving a better impression of the form. Form: Erect—square shoulders—short neck—height of back above line 9 is 14½—top of back, 3¼—side of neck, 4—bottom of armhole, ⅜ above 11¼. No gore under the arm, but a spring of ½ inch at line 18¼, on which line is also the waist length of the back. The waist seam drops 1⅜ in front; is even in front and side, but laps ¾ over the gore in the forepart, which is ½ inch, running up to line 15. Front: Quaker Cutaway, with no lapel—standing collar—front of neck at 3¾—notch in center of 15 deg.—for the button hole side allow ⅜ in front of base, and for the button side ½ more. In front of line 9, allow ½ for both sides and meet base again in front of 11¼. At 15 go forward 3¼—at 20, 2½. Meet plumb base at 26½ and go back 3 at line 32½. Drop bottom of skirt ¼ at the base. Shoulder laps ⅜ at the neck and ½ toward the blade. Gore between the back and sidepiece: ⅜ at the armhole—meet at 10½—½ at 11¼—⅞ at 14½ on back—1⅜ at 15—1⅜ at 18¼—1¼ at 20—⅜ at 25—⅞ at 30. Center of back is hollowed out ⅜ at 17½, and at line 30 the finished hook is 1¼ out.

II.—FROCK COAT.

Breast, 36; waist, 31; seat, 36. Form: Erect—square shoulders—full breast—very hollow back, which causes the shoulder blade to appear pretty prominent—waist diameter very small from side to side. This is a form which mostly has its coat back too long or too wide, and requires quite a close breast measure, or a small square and a full breast. An apparently long coat back behind the arm is caused when the seat has not enough spring. Model: Dia. II. Square of 17½. The height of back above line 9 over the front is 15 numbers—top of back 3½—side of neck 4. The shoulder seam is even at both neck and armhole, but toward the blade there is a lap of ½ inch, and which seam is for the square shoulder. Under-arm gore: ½ at line 15—⅞ at 17½—1 at line 18⅝, which is the length for the waist on the back—⅞ at 20. For the contracted waist length behind, the top of skirt, and the bottom of the back sidepiece seam is even, but lap ⅜ at the underarm gore—1 at the plumb line base—¾ in front. The bottom of the sidepiece is ⅜ higher behind, but when the coat is on, the run of the waist seam is even, on the erect form. At the waist the forepart has a gore of 1¼ starting at line 15. The front of breast is 1⅜ in front of 9—meets the front angle in front of line 15—and strikes the base at 32 for a cutaway. Spring center of back out from line 15: ½ at 20—1 at 25—1⅜ at 30, and then allow 1 in. for the hook. Gore between sidepiece and back: ¼ at the armhole—meets at 10½ on back—¾ at 11¼ over the front—1¼ at 15 on back—1½ at 15 over the front—1¼ at 17½—⅞ at 20—¾ at 25—¼ at 30.

III.—FROCK COAT.

Breast, 34, close measure; waist, 30; seat, 34½; length of legs, 29. Form: Erect—long neck—flat shoulder blades—all normal cut coats fall away from his neck—are too long and too wide in the back and too small in the breast. Model: Dia. II—the square was made 17¾—top of back 2⅜—side of neck 3—shoulders lap ⅞ at the neck and ½ toward the blade—height of back above line 9, 14½ numbers. Gore between back and sidepiece: ¾ at armhole—meets at line 11—½ at line 9 and 14½—¾ at 15—1 at 17½—⅜ at 20—meet again at 25 to 30—¼ at 35.

Spring back from 15—allow $\frac{3}{4}$ at 25—$1\frac{1}{4}$ at 30—and allow for the hook. The front is straight—single-breasted—the lapel is 3 in front of the base on top—$3\frac{3}{4}$ in front of $11\frac{1}{4}$—meets the front angle at $15\frac{1}{2}$—thence parallel with the plumb base. The waist seam is even at the underarm cut—skirt and front laps 1 at line 20, running so forward. Bottom of skirt sinks $\frac{1}{2}$ in front. The vest had $\frac{3}{4}$ lap at the shoulder seam toward the neck and top of back was placed at $3\frac{1}{8}$, and had a spring of $1\frac{1}{4}$ at the center of back at line 20. The vest was cut size 33, and $\frac{1}{4}$ inch allowed in front of the breast, which accounts for the small square and the full breast.

IV. MODEL: DIA. II.

Breast, 35; waist, 33; seat, 35. Form: A combination of stooping and erect—neck bends forward—arms thrown backward—shoulders thrown up and square—very hollow at the back of the waist but erect there—shoulder blades prominent—seat shows very little at the back—front of waist and front of thigh thrown forward—top of back $3\frac{1}{4}$—side of neck $3\frac{5}{8}$—shoulder laps $\frac{3}{8}$ at the neck—$\frac{5}{8}$ toward the blade. Side of shoulder $9\frac{1}{8}$ at 60 deg. Height of back above line 9 is $15\frac{3}{8}$. Underarm gore, $\frac{1}{8}$ on line 9—$\frac{1}{2}$ at line 15—1 at $17\frac{1}{2}$—$\frac{3}{4}$ at 20. Gore between the back and sidepiece: $\frac{1}{2}$ at the armhole—meet at $11\frac{1}{2}$ on the back—$\frac{1}{2}$ at $11\frac{1}{4}$—$\frac{3}{4}$ at $15\frac{3}{8}$—1 at 15 over the front—$1\frac{3}{8}$ at $17\frac{1}{2}$—$1\frac{1}{4}$ at 20—$\frac{1}{2}$ at 25—$\frac{1}{4}$ at 30—$\frac{1}{4}$ at 35. The forepart has a gore of $\frac{1}{2}$ at the waist seam, and the same gore between the skirt and forepart in front. Center of back: From $15\frac{3}{8}$ upward allow $\frac{1}{8}$ outside of the base, and come even again on top—from $15\frac{3}{8}$ downward go inward of the base $\frac{1}{4}$ at $17\frac{1}{2}$—meet again at 22—go out $\frac{3}{8}$ at 30—$\frac{5}{8}$ at 35 for the center and allow for the hook, etc. Front: In front of 9 allow 1—meet front edge and front angle at 14—go out $3\frac{1}{4}$ at 20—$1\frac{1}{2}$ at 30—meet at 35. Sink front of skirt $\frac{3}{8}$, and no lap between skirt and forepart at the waist seam except to straighten the forepart over the gore.

V.—LARGE-WAISTED SACK COAT.

MODEL: DIA. VIIIa.

Breast, 43; waist, 46; hip, 46; seat, 44; length of pants, 32 inches. Form: Large all around—prominent shoulder blades—square shoulders—arms thrown back—neck rather short—head and front of waist bent forward—sides of waist full—all normal cut coats are too high in the neck for this form. Square of $18\frac{3}{4}$, which is small but good. Top of back at $3\frac{3}{8}$—side of neck $3\frac{7}{8}$. Shoulder seam laps $\frac{1}{2}$ at the neck and $\frac{5}{8}$ toward the blade—at 60 deg., 9. Height of back above line 9 over the forepart, $12\frac{1}{2}$. Underarm cut, 1, and stretched up $\frac{1}{2}$. Side seam: even at the armhole, and down to $11\frac{1}{4}$—$\frac{3}{4}$ at 15—$1\frac{1}{4}$ at $17\frac{1}{2}$—$1\frac{1}{2}$ at 20—$\frac{7}{8}$ at 25—$\frac{3}{8}$ at 30. Center of back: From line $17\frac{1}{2}$ spring out $\frac{3}{8}$ at line 25. Front: In front of point 9 give $1\frac{1}{4}$—meet the front edge at the front angle at 20—go out 5 at 25 and 1 at 30—which will give a pretty straight front, but runs a trifle backward at the bottom. On top of lapel allow $1\frac{1}{2}$ in front of the front angle and cut a gore of $\frac{1}{2}$ under the lapel and in the center of the angle of 15 deg. At the bottom sink the front $\frac{3}{4}$ at the base. Notice that the proportions are all small over the breast line, but full in front, and also full at the side of waist, and will make a good coat for that size.

VI.—MODEL: DIA VIIIa.

The breast size is the same as the preceding description, but the waist and hip are comparatively small. Breast, 43; waist, 41; hip, $43\frac{1}{2}$. Form very erect and hollow in the back of waist—shoulders square—arms thrown back, requiring a small square for the back, and a full breast. Square of $18\frac{1}{4}$—under arm gore $\frac{3}{8}$ at $11\frac{1}{4}$ and stretched up $\frac{3}{8}$—height of back above line 9 is $12\frac{1}{4}$—top of back is at $3\frac{3}{8}$ and side of neck $3\frac{7}{8}$—shoulder seam laps $\frac{3}{8}$ at the neck—side of shoulders, 9—gore between side and back: even at armhole—even at $11\frac{1}{4}$—$1\frac{1}{4}$ at 15—$1\frac{3}{4}$ at $17\frac{1}{2}$—2 at 20—$1\frac{3}{4}$ at 25 and 28. Center of back spring: $\frac{3}{4}$ at line 25, starting at $17\frac{1}{2}$—cutaway front. Allow 1 in front of 9—meet front edge and front angle at 15—$3\frac{1}{4}$ in front of 20—$2\frac{1}{2}$ at 25—meet at 28.

VII. A VEST FOR A LARGE WAIST.

Breast, 45; waist, 48; hip, 48; seat, 46. Dia. IV as the model. Breast measure taken over the shirt. The under arm cut is $\frac{1}{2}$ inch at the hollow of waist, but both back and front meet below and above. This $\frac{1}{2}$ inch is simply to give form to the seams. Top of back is $4\frac{1}{8}$—side of neck 4 for top of collar band—bottom of neck band $5\frac{1}{4}$. Side of shoulders at 60 deg., $9\frac{1}{4}$—shoulder seam even, but $\frac{1}{4}$ inch spring at the neck may be good. Center of back is on the line and spring of $\frac{1}{2}$ at the bottom—height of back, $14\frac{1}{4}$. From the point of the angle of 135 deg. go down 7 numbers for the front edge of the vest and go forward a $\frac{1}{4}$ at line 9—$1\frac{1}{8}$ at line 15—$1\frac{3}{8}$ at 17. Cut a small gore in the forepart, below the pocket, in order to make the front to conform to the oval form of

the body. The description of this vest and Dia. XX will fit the same person. This vest, made up and placed on a person of 36 breast and 32 waist measure, will fit at the shoulders, and if it is left to hang alone, will simply be too large all around the breast and around the waist, but hangs good. There is one peculiar feature in this or all large vests cut according to this work, which should be considered. You can draw all surplus cloth together behind, or in front, or at the side, or you may pin it up even all around, and the fit of the shoulders will remain. For this reason, vests one size too large will fit the same, and are better than if one size too small. Cut all vests $\frac{1}{2}$ waist and $2\frac{1}{2}$ inches at the waist line, and pay little attention to the hip line, as long as the sides have an opening over the hips. If no opening is left there the hip line must also receive $\frac{1}{2}$ hip and $2\frac{1}{2}$ inches. Allow all extra waist proportion, by allowing one half of it in front and one half at the side of the back. Any other surplus width, which may be desired may be allowed at the center of the back, where it may be buckled up smooth.

VIII.—Frock Coat for a Very Stooping Form, and with Very Round Shoulder Blades.

MODEL: DIA. II.

Very hollow breast—front of waist and back of waist very erect—square of 18—front of armhole $\frac{5}{8}$ in front of 45 deg., where armhole and sleeve meet at $10\frac{1}{4}$—back sleeve seam laps $\frac{3}{4}$ at line 8—top of back at 3—side of neck at $3\frac{1}{2}$—height of back above line 9, $15\frac{3}{4}$—width of back at $9\frac{1}{2}$, $7\frac{5}{8}$. Centre of back is hollowed out $\frac{3}{8}$ at the hollow of the waist, meets base at 22 and at line 35 the edge for the finished hook is $1\frac{1}{4}$ outside. Gore between the side and back: $\frac{3}{4}$ at the armhole—$\frac{7}{8}$ at $15\frac{3}{4}$—$1\frac{1}{4}$ at 15—$1\frac{1}{2}$ at $17\frac{1}{2}$—$1\frac{3}{8}$ at 20—1 at 25—1 at 30. Underarm cut: $\frac{1}{4}$ at 15—$\frac{3}{4}$ at $17\frac{1}{2}$—$\frac{3}{4}$ at $19\frac{1}{2}$. The shoulder seam laps $\frac{5}{8}$ at the neck and $\frac{3}{4}$ at the blade. Front edge: $1\frac{3}{4}$ in front of 3—$1\frac{1}{8}$ in front of 9—meet at 14—$3\frac{1}{4}$ at 20—$2\frac{1}{2}$ at 30—1 at 35. No gore in breast, but $\frac{3}{4}$ gore in the front waist seam. Drop front skirt $\frac{3}{4}$ at the base.

IX.—FAT MEN'S OVERCOAT.

Breast, 52; waist, 60. Form, very erect; front of waist band forward and abdomen very large and round. The shoulders are normal, and the shoulder seam have the same spring as Dia. X. The model is Dia. X. The square is $19\frac{1}{4}$ numbers, and $1\frac{1}{4}$ numbers are cut out as a gore under the arm, and the sidepiece stretched upward $\frac{1}{4}$. The large square and the large gore under the arm, throw extra waist proportion into the center of the forepart. Neck from 135 deg.—top of back $3\frac{3}{8}$—side of back $3\frac{1}{4}$—at 60 deg. $3\frac{1}{4}$—base $3\frac{1}{4}$—armhole from 135 deg.: front sleeve nick at $10\frac{3}{4}$—at 60 deg. $8\frac{7}{8}$—at 45 deg. or top square $9\frac{7}{8}$—width of back at 8 is $6\frac{7}{8}$—bottom of armhole is $\frac{3}{4}$ above line $11\frac{1}{4}$, and the front sleeve base is forward two seams. The front of armhole is on 45 deg. Center of back: height of back above line 9 is $12\frac{1}{2}$ numbers—from line 15 spring out $1\frac{1}{4}$ at 25. Center of front from the plumb line base: top $\frac{3}{4}$—$\frac{1}{2}$ gore, $\frac{3}{4}$ to edge—at $11\frac{1}{4}$, $4\frac{3}{4}$—at 20, 6—at 30, 6—drop front of bottom 1, and set the buttons back from the edge about $2\frac{1}{2}$ inches.

Now, while I am describing "*Odd Forms*," which in reality are not odd at all, only a trifle different from the so-called normal form, it may be well, to point out another fact: For coats and vests all large-waisted forms require either a proportionately smaller scale with extra allowance in front of the breast, or if the measure and the scale are used the same as on a small-waisted form, the square must be made smaller, and the front must be that much larger.

It is the same on the full-breasted and on the erect forms, and the description of Forms V and VI, as well as Dia. VIII a, with their different squares ought to be sufficient to give a general idea of what is to be taken off behind in the square, and what is to be allowed in front. Large-waisted persons have mostly erect forms even if they should have prominent shoulder blades, or throw their necks down in front. At the hollow of waist they may be considered erect and mostly throw their arms backward, and all such forms require a smaller square and a larger breast. The best way to measure is this: Take all measures even and close, and reduce the square, and enlarge the breast according to the above description, and according to your judgment, and remember, that $\frac{1}{2}$ inch more, or $\frac{1}{2}$ inch less in the breast, or in the square, may be considered the outside limit, and that $\frac{1}{4}$ inch goes a good ways.

In regard to the amount, you better learn to depend upon your judgment, for if that should be ever so poor, it will be better than a so-called proof or balance measure, from the center of back forward. That measure, even if taken with the utmost care, will mostly depend upon the coat which the person wears, and not upon the body, which is to be fitted.

LOW SHOULDERS.

LOW shoulders and long necks are the same. Dia. IX shows the correct alteration for such forms as well as for the stooping form. The body between the arm and neck becomes longer than usual, and consequently the coat must be lengthened on each back and front alike. Attempting to cut the shoulders lower at the arm will never lift the coat up to the neck. If that alteration is correctly made no other portion is to be altered. All allowance for a longer neck should be given sparingly, as $\frac{1}{4}$ in. on each back and each front goes a great ways; only extremes may require more, and from $\frac{3}{8}$ to $\frac{1}{2}$ in. may be called correct for the average long neck. The front of the neck hole should not be raised on a long neck, for the very length of neck requires extra depth there. Addition for a longer neck should be started at the middle of the shoulder seam, as indicated by dotted lines in Dia. IX.

Raising the side of the back up higher requires the center of the back higher also, all of which may be run out to nothing at the sleeve base. Adding say $\frac{1}{2}$ in. to the top of the neck will make the shoulder look broader, that is, the shoulder on top of the slope will contain more space from arm to neck, though the diameter of the shoulders from side to side may not be any larger. The armhole must be considered the same for all long or short necks, and the changes must be made upward, and above the armhole, as shown in Dia. IX, and if that is correct, the so-called "front shoulder point" exists in the imagination of each individual cutter only.

If the shoulders and the neck of all men were formed the same, there would be very little trouble to fit coats. But the longer, or shorter, or forward or backward leaning neck play smash with the fitting points. All kinds of imaginary proof measures have been invented, but they all will prove that they are not proof, unless the measure is a straight one, either horizontal, or perpendicular, or parallel. The proof measure, as shown in Fig. I, and which consists of the application of the angle of 135 deg., is a new measure, of my own invention, and it will do away with all the so-called long or short balance measures which have been used for the last century.

When I say give so and so much more for a long neck, I mean so much more than what is shown in Dia. II, all of which may be divided between the forepart and the back, but so that the top of back is never less than $2\frac{1}{2}$ in. wide. I will repeat here that a long neck not only requires the shoulder straps longer, but the top and the side of the back must be cut closer toward the center, gradually running out at the front. If the shoulder seam has 1 in. spring, that is, $\frac{1}{2}$ to $\frac{5}{8}$ more than Dia. II, the top of back may be placed at $2\frac{1}{2}$ and the side of neck at 3, and this will make a good proportion for the average long neck. So far I have found in my practice, that very few cases require more. The worst case I ever found was fitted with $1\frac{1}{2}$ spring allowed on the forepart, with top of back at $2\frac{1}{4}$ and side of neck at $2\frac{3}{4}$, and I do not think that there is any shoulder which requires more. In all cases the collar must be sewed on easy, on each "*side of the neck*," not behind.

But here I will give another idea of fitting a long and straight neck: At the center of the back and from the back sleeve base upward, go outside of the base and allow say $\frac{1}{2}$ in. "*extra*," and at the same time allow $\frac{1}{2}$ in. on top of back and at the side of neck. The $\frac{1}{2}$ inch extra allowance on the back may again be reduced from the front of neck downward, but this is of little consequence, for if not cut off, the laped and the breast will simply be that much larger, which is mostly a "*good fault*" for such a coat, and may often be quite necessary, as all such forms are mostly full breasted. If for any cause, the top of back and side of neck are placed closer toward the center, do not drop the front of the neck hole, because the extra spring at the shoulder seam will produce all extra length required.

The low and the high shoulders may be considered very indefinite terms, and a cutter must learn to use his judgment as to what each particular customer requires, but for the reason that Dia. II will fit at least 49 out of 50

persons, all changes must be made with great caution, because the actual shoulder is not to be fitted at all, and if anybody attempts to do this, he must cut low shoulders for most all, and the majority he will have to alter, more or less.

About a year ago, while at church on a Sunday, I noticed a man who sat in front of me; he wears different coats according to the weather. Two of such coats fit him as good as any can be made, but one coat makes him low shouldered while the other gives him the appearance of a square shoulder. The square shoulder coat don't fit as close around the arm as the one with the low shoulder, but the square shoulder hangs good, sleeve included, and no one will ask anything better. Any cutter can satisfy himself on that point by trying on different good fitting coats, on the same person, and by doing so he will soon find that a solid measure around the arm and shoulder, or a so-called "*Balance Measure*," is one of the greatest delusions the Nineteenth century has brought forth, in so far as fitting garments is concerned.

But I must point to another reason why a coat can be fitted to the same person with either a square or a sloping shoulder. A coat cut too high up at the back and at the side of the neck will have the appearance of a lower shoulder, because the coat starts higher up. At the present time the style for the shoulders is toward a square shoulder, and I think that will be the style for some time to come. Looking back to continental styles and pictures, we find all coats high up at the back and at the side of the neck, and consequently all are represented as low shoulders.

In fitting clothing according to the present style, a cutter must see, though he is compelled to cut a coat for a long neck higher than usual, that it gets not too high, but as low as possible for that purpose, and cutters who are not *above trying on* will often find it to advantage to change the height of the collar a trifle, thought the fit may be the same for all. This is another point which cannot be learned by rules, or from books, or in cutting schools, but must be acquired by practice, after a cutter's mind has been directed to it, and his mind must be clear always, and never be benumbed by whisky, or by tobacco, nor by fast women.

EXTRA SQUARE SHOULDERS.

REAL square shoulders are seldom to be found unless the form is classed among the humpbacks, when the shoulders may even be higher at the arm than at the neck. By the term "Square Shoulders" is usually understood to be squarer shoulders than are ordinarily found. But right here let me say, that as long as the shoulders are cut on the angle of 135 deg. there is not much danger of getting them too low or too square for almost anyone, for the reason that coats are not to be cut skin-tight at the armhole. The armhole must be larger than the body all around, and no coat feels agreeable or looks well if the armhole is tight-fitting on the top of the arm or at the shoulder seam.

The shoulders should fit at the neck, but not tight. They should hang and balance themselves between the arm and the neck, where neither the movement of the neck nor that of the arms interferes with the coat. At the arm, the shoulders of a well-fitting coat should be loose, and as long as the sleeve fits so that it will not drag the armhole out of place such looseness will remain there, forming a square shoulder.

A shoulder that appears flat on the top, and breaks behind or in front, will always set better when the sleeves are out, because the sleeve-head is too short, pulling the shoulder downward, and it must make a break either in front or back of the arm; and it is for this reason that whenever they try on coats the journeyman is required to baste in one or both sleeves. For this reason, I claim the sleeve system, as laid down in this work, is far superior to any other. To fit the shoulders and the sleeves together is really a question of how not to fit the body of a person, and still, produce a garment which will take the eye of the public. A tight-fitting shoulder at the arm, and a tight fitting waist in the back, are not the present conception of fit, or of style, for men's garments, and in all probability never will be.

The shoulders are based upon a slope of 22½ deg., not because they slope just that much, for they may be 22 or 23 deg., or anything near that, but that is a good average; and 22½ deg. is the fourth part of a square, and is an even division of a square, and a known quantity.

I will here say: Extra square shoulders are seldom found which cannot be fitted by Dia. H, by simply cutting the spring between the shoulder seam ¼ less at the neck and placing the top of the back and the side of the neck say ⅛ to ¼ of a number lower, while the armhole remains as it is, including the sleeve. There is no question but that the lower, or the higher shoulders, can be fitted by making the change at the armhole, but in either case the whole armhole and the whole sleeve, as well as the waist, requires a re-adjustment. But I do not want to earn glory by giving a description of it.

SCIENTIFIC CALCULATIONS IN THE SQUARE AND CIRCLE.

(SEE DIAS. XI AND XII.)

THESE are not given for practical cutting, but are given as an example of scientific calculation in garment cutting. Although they are quite plain they may be called scientific conundrums, because the present generation of cutters knows nothing about them.

SCIENTIFIC CONUNDRUM IN THE SQUARE.

Mark a square of any unknown surface; divide one side into 20 equal parts, each part of which is a unit, or one number of the scale; use said 20 parts as a scale, representing the half breast circumference, and $2\frac{1}{2}$ inches; with this scale make a diagram or draft of a vest, or coat, according to this work—all of which is done before the size of the square is known. When done, measure the square, or 20 parts of the scale, by inches.

Now, suppose the square turns out to be 20 inches; the size of the garment is 35 breast, or $17\frac{1}{2}$ inches and $2\frac{1}{2}$ inches. If the square turns out to be $22\frac{1}{2}$ inches, the garment will be size 40, and so on, always $2\frac{1}{2}$ sizes less than the square. If, however, the size of the square is too small to make a full size, multiply its units by any number whereby you can find a certain desired size. For instance: If the square contains 5 inches, each $\frac{1}{4}$ inch is a unit, or one part of the scale. Multiply the 5 inches by 4 and you have 20 inches. Now, take 4 units of the original, which represents here 1 inch, and your new scale will represent 20 inches divided into 20 parts, and will also cut size 35. If you multiply the 5-inch square by $3\frac{1}{2}$, you will produce 18 inches, and if you take $3\frac{1}{2}$ units as 1 unit, each unit will represent $\frac{1}{20}$ of 18 inches, and the size of the garment will be $30\frac{1}{2}$. If you multiply the 5 inches with $4\frac{1}{2}$, you will obtain 22 inches, and by taking $4\frac{1}{2}$ units as 1 unit for the scale, each unit will represent $\frac{1}{20}$ part of 22 inches, and the size will be 39.

SCIENTIFIC CONUNDRUM IN THE CIRCLE.

Divide the half-diameter of a circle into 20 equal parts; then measure the half-diameter of the circle by inches, and if said result does not give a required size multiply the same as in a square; use the same units, and the same result will be obtained. All this must be done as in a square of 20, but afterwards the square of $17\frac{1}{2}$ may be produced as shown in the diagram.

Fractional multiplication will result in the same thing, but may result in the fractional sizes, as $34\frac{1}{2}$, $35\frac{1}{4}$ and $36\frac{3}{4}$, and so on. The six points of the compass will give all the base lines correctly on the square of 20 as well as on the square of $17\frac{1}{2}$. It requires no scale, for one main point will give the other complete. The full diameter of the circle is 40 parts, and the triangle, as shown in Dia. XII, contains 35, half of which is 20 and $17\frac{1}{2}$, for which reason the square of 20 and the square of $17\frac{1}{2}$ is adopted as a base.

With the aid of the above calculations a person can go to any cutter, obtain from him any graduated scale, and with it cut a garment before he knows the size thereof. Or he can select for himself a scale from any set for a certain size by simply finding a scale whose 20 units will correspond with the size. Should the scales contain too large or too small units, they may be multiplied or divided, and a new unit found by doubling or halving the units, or by dividing or multiplying them with any number, to gain the desired result.

The conundrum is this: To use an unknown square or an unknown circle to cut a garment, and produce the smaller sizes large enough and the larger ones small enough for all practical purposes.

CHIPS AND WHETSTONES.

A SWEEP from the point of the angles, as at 80, will make a horizontal line when the pants are on and inflated with the body. No squaring from any one line will make it perfectly horizontal all around. The sweeps from the points of the angles will always be together when the pants are correctly sewed up and flat upon the table. Said sweeps will not fit together in all positions, if made from any other points, which proves their common center; and they will always be found reliable for the connection of the leg seams when the front is cut small and the back wide, and for squaring the bottom of pants.

Never change the angle of seven and a half degrees as a base.

Never try to find the perpendicular and horizontal lines on a pants, except for a person who always stands perfectly still; and as no such persons are found, said lines are therefore useless.

Allowance in the curve of the back of a pants cannot spread like the front, but will hang there like a bag, and may even cut the seat.

Extra width should never be allowed in the back of the crotch; better allow it over the hip. Allowing extra width in the crotch is just like allowing extra cloth on the front of the armhole,—it makes the whole smaller.

The trick in altering any garment is to first ascertain what will make it worse, and then make the contrary alteration. Example: If a pants cuts in the seat pinch the top of the sides together, which will make it worse, then put a wedge in the top of the side seam, and reduce again in the center of back.

If you find your pants too large or too small do not change the drafts, but take the measure smaller or larger, as the case may be. Take the seat measure close, like measuring a barrel, and have no slack.

Your customer's pants waist must be as large as what he measures when he is in a sitting position. A man's waist in that attitude may expand anywhere from one to five inches.

A waist-band made according to the old teachings, as three-fourths inches more than half measures, will not stand the test, and is a delusion.

If a customer tells you to make his clothing very large, he means that it should not be too small. If he instructs you to make it tight, he means that he wants it not too large. Either will be returned if it does not come up to his actual wants.

If a customer gives you a thousand and one directions, take them all in, study what he wants, or what he really needs, make his garment accordingly, and he will usually turn out as a customer not hard to please. But if he tells you that *you* are the tailor; that *you* know best what he wants; that *you* shall make it according to your judgment, do not think that he will take anything, for he will usually turn out to be a very particular customer, who expects you to know your business.

Remember that old men require a larger seat—that is, a larger back slope in their pants; because, in aged persons, the seat actually eaves downward, hence old persons grow shorter.

Give boys considerable straddle in their pants, not only for comfort, but for the more important reason that boys should never have any pressure on their sexual organ. Thousands of young men go to their early graves because some silly tailor made their pants too tight, by which they learned to abuse themselves.

Better talk half an hour with your customer after he has been measured, in order to observe his build, rather than to spend half a day in altering afterwards.

Do not consider yourself too expert a cutter not to try on the coat you cut. No cutter is infallible. But trying on a coat without sleeves will be found "no good."

Your trade will depend upon how you please your customers, *not how cheaply* you work.

The best customer is he who trusts you, and the worst is he whom you trust.

As long as your customer believes that no one else can fit him, you will have his patronage.

A cash customer's trade is lost as soon as you trust him.

Trust no man for his wedding suit, even if you ever do get your pay; you will earn it over again by "dunning" him.

The best way to collect bad debts, is never to scatter any around you.

A large funeral is had only by those who collect their dues.

You may feel happier if you give a poor man a suit of clothing. Try it.

You will surely be angry if you trust a so-called "gentleman" and get caught—better not try it; but put your trust in God.

Do not try to alter a faulty waist by changing the neck of a coat, or *vice versa*. You will always fail.

Do not try to convince your customer that you have sold him a suit too cheap. You will lose him, for he expects that you will endeavor to make it up if he gives you another chance, and therefore will buy the next suit elsewhere.

If an old customer begins to grumble, try to pacify him, but if you cannot, better let him go for a time; he will be so much better when he returns.

A new customer may be "cranky" when he starts in with you, but if you treat him right he may turn out to be your best one.

To make a nice edge on worsted goods without binding, work the underside with a button-hole stitch and fill the edge like broadcloth. It takes a few hours extra work to make such an edge for a coat, but it saves the binding, and it makes a neat job for anyone who does not want binding on the edges of his garments. Reasonable stretching of the edges of a button-hole, while making, is better than drawing the edges together.

Cords to work button-holes over should be made by twisting three or four fine threads of silk together, and doubling it and letting that twist together again. This will make a strong cord, which will not fade like gimp or linen thread.

Corded pockets on raveily material should be sewed double, not one seam on top of the other, but one alongside of the other.

Next to natural gas, gasoline is the cheapest and the most convenient fuel for heating irons in the hot season. Gasoline will loosen and destroy all gum at the pants bottom, or wherever it is used. Gasoline is the best article to clean straw goods, if used with a brush, and it is the best and cheapest article to remove grease, or any spots from cloth. To remove fresh paint spots from cloth, soak the paint with some kind of oil, common coal oil will do, until the paint becomes loose and soft; then wash out with soap and water. This will not injure the cloth, nor will it require any scraping whereby the nape or surface of the cloth is made threadbare.

Guarantee nothing but the fit and good sewing; all other guarantees are worthless to either party. How can you guarantee the color of any material when you know that rain and sun and time will change even the color of a live animal? Guarantee the color only so far as to be as good as any other of that kind, or as far as you know, and your customer will always be satisfied with you if not with the color of his garment.

Pieces of silesia are just as good for stays as Holland linen is; therefore cut your sleeve lining or your vest lining out of the whole cloth.

As a general rule, garments should be made up with very little wadding. I have made my vests without wadding for years and no customer has found fault. Black wadding should never be used for vests, it soils the lining.

Some, especially young cutters, may not know the following, but to them it will be worth the price of this book: If a coat is too small in the breast and no outlet anywhere, cut the canvas, and all lining and all padding through downward, and at the center of the breast, and insert a wedge of say one inch, after which the outside can be stretched that much, and the stretching will never go back. If the armholes are too small and no outlets, and the breast will become too small if the armholes are cut forward, cut the lining and padding through, under the arm down to the waist, insert a wedge of say one inch and stretch an artificial wedge in the outside until the armhole is large enough; this works always. It may cost a good deal to alter such a coat, but if a coat is worth altering at all it is worth altering right, and it is better to spend a few dollars for alteration than to throw the coat away; but you must be a cutter or a bushelman who knows how to do it.

To find an angle of 135 deg., go up and sidewise equal distances and strike a line as in Dia. IV.

An angle of 135 deg. is one square, and one-half square divided from corner to corner.

The angle of 120 deg. consists of two points of the circle, as shown in Dias. XI and XII; each point is 60 deg.

The Equilateral Triangle consists of three equal lines, each line of which is 60 deg., like in Dia. XII.

To find the angle of 15 deg., spread two lines one-fourth of their length, or 20 in. long and 5 in. wide.

To find the angle of 7½ deg., spread two lines one-eighth of their length, or 80 in. long and 10 in. wide.

If I had known something of geometry, it would have saved me years of labor on this book, but somehow we all must dig for our living, and sometimes our digging is very uncertain, and we may find things which we never dug for. Such is the ways of an Allwise Providence, and it is a blessing, maybe in disguise, that we must grope in the dark; but when everything around us is dark and uncertain, we should put "*Our trust in God*," and we will be brought from "*Darkness to Light*," in due time.

A short lecture to young cutters: "The glory of young men is their strength, and the beauty of old men is their gray head." Young cutters, do not spend your strength on fast women, nor do you exchange your money or your beauty for strong drink; you need all of it when you are old, and all of it you should have while young. As a general rule old cutters are useless. You may kick against such a fate to your heart's content, but it will do you no good. The old must decline. As it is not natural for young women to court the attention of old men, so it is not natural for young men to patronize old cutters or tailors. Merchant tailoring, without young men's patronage, will, and must always be a failure. Forget it not! Forget it not!

How to treat an apprentice: I commenced in March, 1848, to learn tailoring. I worked three years for nothing; my parents furnished me with clothing and boarding. There were only two houses between my parents and that of my master, and some of my folks always called me when ready to eat, and I had to come back when eating was done; there was no such a thing as an hour of rest at any meal. The first two years of my apprenticeship were, I believe, worse than the lot of any slave. In summer time I had to come to work at least at five in the morning, and after about one and one-half hours work, I had to get breakfast, and thus I kept on until dark, which was near nine in that latitude and in the longest days. In fall and winter I had to be there at six in the morning and keep up till nine in the evening, and three or four weeks before any holiday I had to work till midnight and all day Sunday. For all this I do not remember to have received more than "*zwei groshen*" as spending money, during the first two years. But the master worked at the same rate, and in the spring of 1850 he died of consumption. After that the widow carried on the business, and a new foreman, Mr. Geo. Hase, treated me more human. As a general thing, he would not let me work over twelve hours a day, and every now and then he gave me a few "*groshen*" for spending money, and the Lord has blessed him with a long life, and so far as I know he is still living in Crawford Co., O., and well and hearty, and as an ex-soldier, draws a good pension from "Uncle Sam." But I must return to my first two years serfdom. I had to sew all the seams: I was nothing but a sewing machine, and after one year's slavery I could sew like lightning and that was all that I had learned during that time. I was constantly driven to sew faster, in order that others might go ahead with their work, and in my misery to escape from such a "hell-hole," I conceived this wish: If I could contrive something by which means I could make stitches as fast as I could count, I should not care if I had to give "*Old Harry*" a deed for myself, for all time to come. Boys may have ideas, too, and this was one of them. At that time I had no idea that that same thing was just then completed in America, and that, too, without the help of the devil. Well, after I came to America in 1852 and found that just then sewing machines were completed, and that they sewed even faster than I could count, I was very glad that I was fortunate enough not to be the inventor of one, though there were millions in it. I would always consider that Old Harry would appear and prove a just claim against me. I started this point to tell how to treat a boy, but I should have said: "*How not to treat him.*" But I must start in again. During the last fifteen years I have instructed seven boys, and I have found that boys of sixteen to seventeen years of age are the best to instruct. Such boys are able to work, while younger ones are too tender to be kept constantly at work, and older ones soon think themselves too smart, or too big to obey, but even if they are obedient, they are naturally harder to instruct, especially when they commence running after the girls. There are exceptions, however, and I would sooner instruct an intelligent boy of twenty years, if I were satisfied that his mind was made up to learn. Take only healthy, intelligent boys, who went to school, and are willing to work. I have rejected several boys whose parents came to me saying: "*He is not fit for much, but he is good enough for a tailor*," or, "*he is lying around on the street, and we want him to go to the tailor shop, so he learns to do something*," etc. Well, as long as a boy is fit to be a tailor, well and good, he needs no other qualification, but the qualifications to become a good tailor are just as various as that of a lawyer, or a doctor, or a preacher. If a boy is not brought up to work, but has been loafing most of the time, I would not risk him as an apprentice. After all other things are considered, and the apprentice is to be taken, make as good a bargain with him or his parents, as you can. Get him as cheap as you can; tell him that tailoring is all work, with not much fun in it, and make him work regular hours, and any boy can stand

ten hours work. Give him to understand that he is not to be a slave, though he must work, and if he pays attention to the work and learns fast, and does what can reasonably be expected, give him a word of praise and a quarter or half a dollar weekly for his special use, and when a show comes around, or something special goes on, give him a ticket and a holiday and you will have the good will of the boy, and that will repay you for any liberality you may bestow upon him. My way of instructing boys was this: To learn to sew a back-stitch by hand, to fell on patches, to get acquainted with the sewing machine, to clean, oil and operate it, on straight seams first. Next teach him to baste up the sleeves and to make the sleeves on common coats if any such are made. Teach him to make inside coat pockets, hip pockets in pants if it can be done, then gradually show him how to make a pocket for the outside of a coat, teach him to baste and to pad the canvass and padding over the breast. Show him how it is to be done, and why it is to be done so, and not otherwise. If he makes anything wrong, explain it again, and again. Never scold and call hard names, and if you say some harsh words to him, speak that much more pleasant to him a few minutes later. Make him understand that you can smile over one of his mistakes and that he must not hide them, and that he will make mistakes as long as he works at tailoring, and that all tailors are in the same condition and therefore must watch themselves. A boy with a sensible instructor can learn the above in six months, and then he is worth something, and within one year from the start a boy can learn to make a fair sack coat, and in another year he ought to be able to make a tolerable good coat, pants and vest. Boys should be taught to make pants and vests besides making coats, in order that they may be able to instruct others, *should occasion require*. As soon as a boy is able to handle a needle, he should be set to work, to spend any time he may have to spare, in making button holes, which may be just as well done, in the beginning as in the end. Let boys work button holes in patches, and in a few weeks they may be able to make button holes in the flys of pants, and by the end of two years they are able to make a good button hole.

It is also a good idea for boys to become acquainted with cutting garments as soon as possible. They will learn faster, because they have more interest in tailoring, and are stimulated by the hope of becoming cutters in due time; and even if they never become cutters, they will be so much better tailors if they know how to cut. It is true not all good tailors will make good cutters, and vice versa, but "cutting" is considered a higher degree of tailoring, and every tailor ought to know something about the cutting and the fitting of the garments he makes.

From the "BOSTON TRANSCRIPT.":—

THE TAILOR.

The tailor is a very worthy person, notwithstanding his occupation, like that of the enemy of mankind, is to sew tears.

You can hardly call him a person, as it takes nine of him to make a man. Therefore when anybody asks you if a ta lor is a man, you must answer, Nein. A tailor, in fact, is but one-ninth of a man, a vulgar fraction. This makes him a little man, or a manikin, and therefore to man akin. Hence, for convenience sake, I will call him a man.

Most men reap what they sow, but the tailor reverses the process and sews what he rips. He is generally kept hard at work, as his business is most of the time pressing. Sometimes he is quite poor, but need never go hungry, as he always has a goose, and finds no difficulty in getting all the cabbage he wants.

Some people complain of the tailor because he is generally behind time with their garments; but the tailor doesn't care to sell clothes on time, and in fact he suits most of his customers.

Many mean things are quoted against the tailor, but he gets even by coating those who talk about him. No matter how he seems in society, a good tailor always seams when about his work.

There is one thing very strange about the tailor. Although the pantaloons he turns out are constructed on correct principles, he makes them all cross-legged. Like other men he pants for renown, but is mainly concerned for the renown of his pants. If you say ought against his trousers, I trow, sirs, he will give you fits. No matter how he may wear with others, the tailor tries to make others wear well. If he trusts you for your breeches, do not repay his kindness by breaches of trust.

He cuts his cloth economically, and yet much of it goes to waist.

The tailor is as good as man in general, but I never knew but one General Taylor who achieved especial distinction.

Some people object to the tailor on account of his bill; but it must be admitted that a little bill is beak coming.

The tailor is a great student of human nature. He takes the measure of every one of his customers. Of this you may surely speak. The tailor is full of pluck. I have seen him collar a man twice as big as himself, and he did it coolly and without choler.

The good tailor never slops over, though he puts in much time over slop work. The tailor cuts to order and orders to cut.

One thing must be said in his disprai-e. He is the most inveterate fellow to buttonhole a man you ever saw. Another thing: Notwithstanding almost everybody cares more about the outside than the inside of his coat, the tailor will make the inside more lasting than the outside.

He makes custom work and will work for your custom. Too often when his work is done he has to dun his customer for the pay. The tailor owes his living to sin, for through sin came cloth; but though one of the cloth, the tailor is not a clergyman, who also, by the way, gets his living through sin.

Address him at the old stand, and a dress he will make you.

From the "AMERICAN TAILOR."

BLUE MONDAY.

The cutter who is afraid of Monday is as miserable as his deadliest enemy could wish. Saturday the coats which he has seen tried on were all more or less faulty. One was too large, another too small; one kicked at the waist, another was too large at blade; one creased through the shoulder, another fell away from the neck; one sawed the ears and another would not cover the collar button of the shirt. He goes to bed Saturday wondering if the boss has made up his mind to give him Hail Columbia or the grand bounce. He awakes Sunday, nervous and fidgety, and feels that he would like to have some one die suddenly and leave him a fortune so that he could run away and hide his misery. At noon he thinks he may, after all, come out all right. At night he wonders how many suits will come back on the morrow, and when he sleeps he dreams of processions of angry men walking over him with misfit garments, and a disgusted employer trying to persuade him that he is a complicated idiot. Monday morning he goes to the shop reluctantly, smiles with a sickly assumption of confidence, shakes and trembles as he says "Good morning,' and wants to perform the knot hole act as the first bundle of clothing is returned. It is all right to

"Pity the sorrows of a poor old man,"

but when it comes to downright agony, we are of the opinion that the cutter who is afraid of Monday can discount the "poor old man" and is entitled to unlimited commiseration. He is miserable beyond imagination, crushed, chronically, into mental jelly, and rendered abject and ridiculous by the haunting fear of returning bundles.

The awful terrors of each Monday's morn,
Make the *poor* cutter wish he were not born.

Nov. 26th, 1891, 4 p. m.

This is Thanksgiving day and I am glad *I can say:* This work has been finished to-day, except corrections which must yet be made. This means that I have spent most of this legal holiday by working on the manuscript of this book, and I hope that some of my fellow workmen will be benefited by it.

But I cannot let this opportunity pass without publicly acknowledging the guiding hand of an Allwise Providence, which has been visible to me in the past and in whose power I trust. I know of no better way to express my feelings at the present hour than to repeat the first and last verses of that beautiful German hymn which was sung in church this morning:

1. Lobe den Herren o meine Seele!
Ich will ihn loben bis zum Tod;
Weil ich noch Stunden auf Erden zähle,
Will ich lobsingen meinen Gott,
Der Leib und Seele gegeben hat,
Werde gepriesen früh und spät.
Hallelujah! Hallelujah!

8. Rühmet ihr Menschen den hohen Namen
Dess, der so große Dinge thut!
Alles was Odem hat rufe Amen!
Und bringe Lob mit frohem Muth,
Ihr Kinder Gottes, lobt und preis't
Vater und Sohn und heil'gen Geist.
Hallelujah! Hallelujah!

Aug. 15th, 1892.

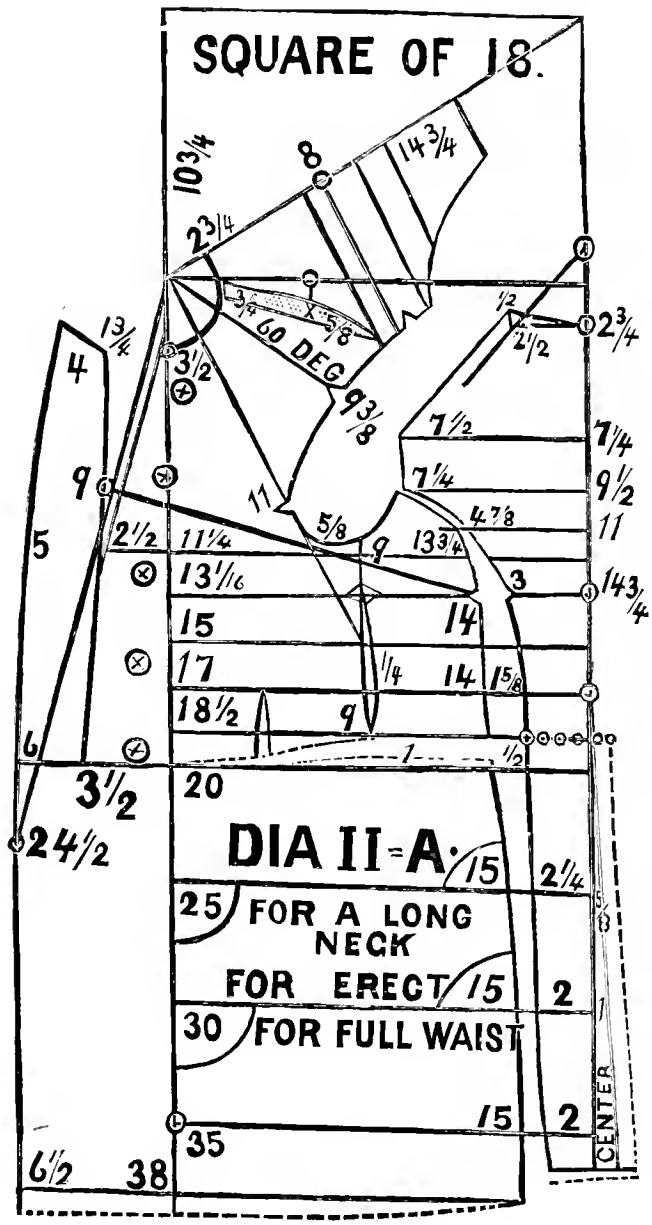
FORTY YEARS OF GRACE.

On the 15th day of August, 1852, I was a passenger on a sailing ship nearly in the middle of the Atlantic ocean. On that night we had a storm of a pretty good size, and the way our old ship was rocking us, it seemed to me that I would never see daylight again. Well, that condition of things will learn a poor sinner to pray, and learned me to pray at least for that night, and in my prayer of that awful night I promised the Lord, that if he would deliver me from the *Perils* and *Dangers* of that night, I would always keep the 15th day of August as a day to offer especial thanks to Him as my Deliverer. *Will the Lord seems to* have heard my prayer and that storm passed off and now—forty years after that time, I am able to record it in the pages of this book. I feel as though I cannot close this work unless I give at least one page of it to the praise of Him from whom all blessings flow, and who is able to deliver us from all dangers.

But I must acknowledge that I have not fulfilled the promise of the night of the 15th of August, 1852, at least not in that sense in which I made it, though I have remembered it every year but one, when it slipped my mind until a few days after. Some of my readers may say that it is silly to write the above in this book, but I think any place is good enough to give thanks and praise to the Lord.

SUPPLEMENT.

THE manuscript for this work has been closed, but I feel that I must write a few things more, for I intend to record all that I know, at least all that which I remember and is worth knowing, and all that which I may have learned since the manuscript is closed. I have come to the conclusion that it would be better to give a frock coat diagram with no lap at the front waist seam, and for this reason I have made Dia. II a, and in order to make the most of it, I have made it to fit the following forms:



I. For a medium long neck.

II. For a medium full waist,

III. For a medium erect position,

IV. For a medium short form,

and to the following measure: Breast 37, waist 37, hip 38, length of waist 18, length of coat 36, length of legs 30 inches.

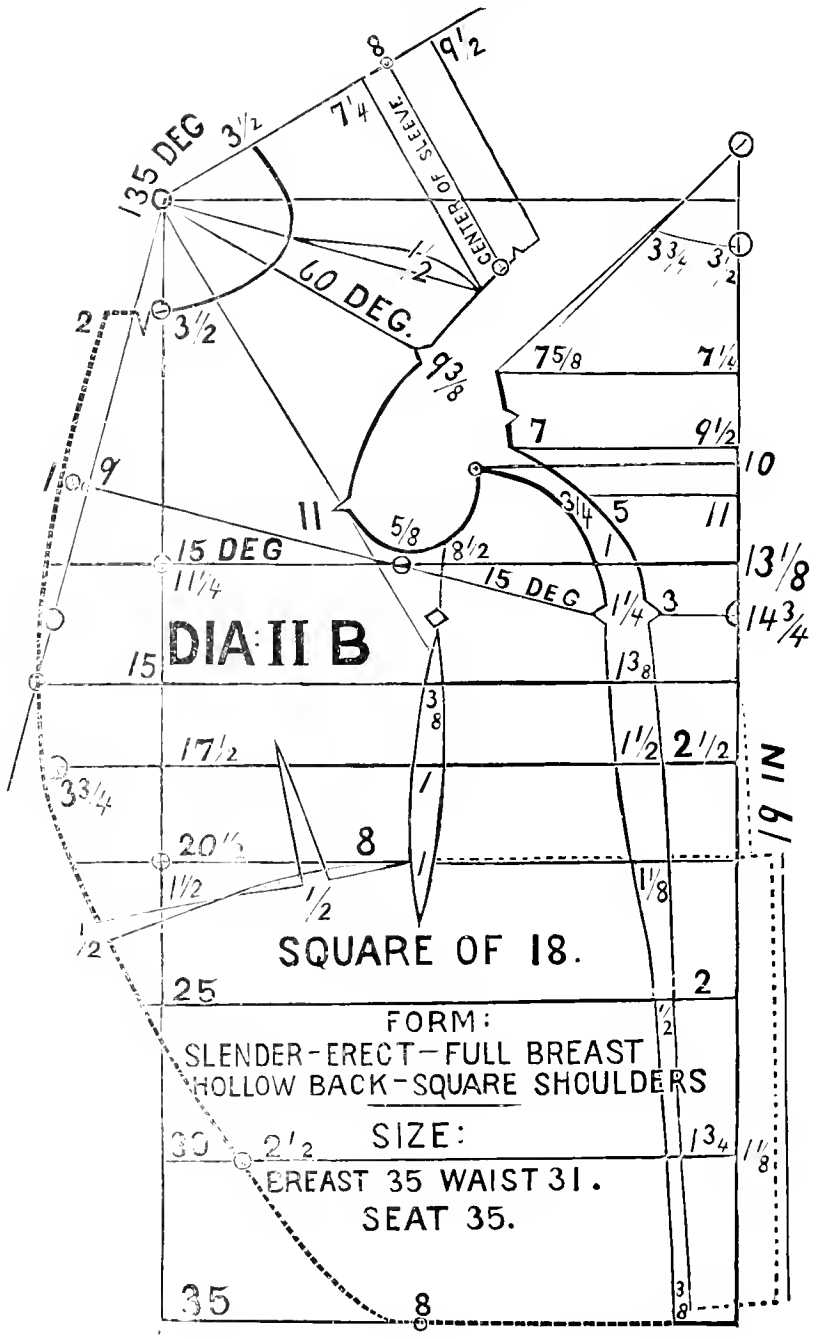
Dia. II a is a trifle wider at the shoulders than Dia. II, which is seen by the $9\frac{3}{8}$ at 60 deg., and by the width of the back at the armhole, which is $\frac{1}{4}$ number more, and which requires the back sleeve seam $\frac{1}{4}$ shorter than Dia. II. The neck is for a form with $\frac{1}{2}$ in. more length than the normal form, hence the top of back is placed at $2\frac{3}{4}$, and the spring between the shoulder seam is $\frac{3}{4}$, which requires the collar to be sewed on loose over the side of the neck. The armhole is in all respects the same, and the neck is changed from the top of arm upward.

Dia. II a shows a full waist which is shown by the $\frac{1}{4}$ gore in the underarm gore at the waist, and in the larger width in the front of waist. The roll is shorter than on Dia. II. It buttons three buttons but may easily be made longer. The heighth of back above lines 9 and $13\frac{1}{16}$ is only $14\frac{3}{4}$, being $\frac{1}{4}$ shorter over the blade, because most all such forms are more or less erect forms. In place of a lap of 1 in. in front the waist seam has a gore of 1 in. behind, and the run of that seam may be made to suit fancy or style. In cutting, the top of sidepiece should be run out into the armhole until it is long enough for the back from the nicks upward, as shown on Dia. II B.

DIA. II B.

I also add another diagram, II B. which illustrates the erect and slender form—hollow back—full breast—square shoulders—forms which are mostly hard to fit. It is on the same square as Dia. II and II a, but the difference is shown between the back and the side piece. The height of back is $14\frac{3}{4}$ and the front and back is even at the neck for the square shoulder.

Now, it will be seen how closely Dia. II, II a and II B are connected, and yet how far they are from fitting the same form. With the help of these three diagrams it seems to me any cutter should have easy sailing in fitting his customers. There is the tall, slim person to be fitted by Dia. II and II B, and the short form and the full waist by Dia. II a, and any of the other abnormal conditions here shown by the three diagrams, may be taken from one of them and placed on the other. Often, the abnormal conditions may be just contrary to the illustration.



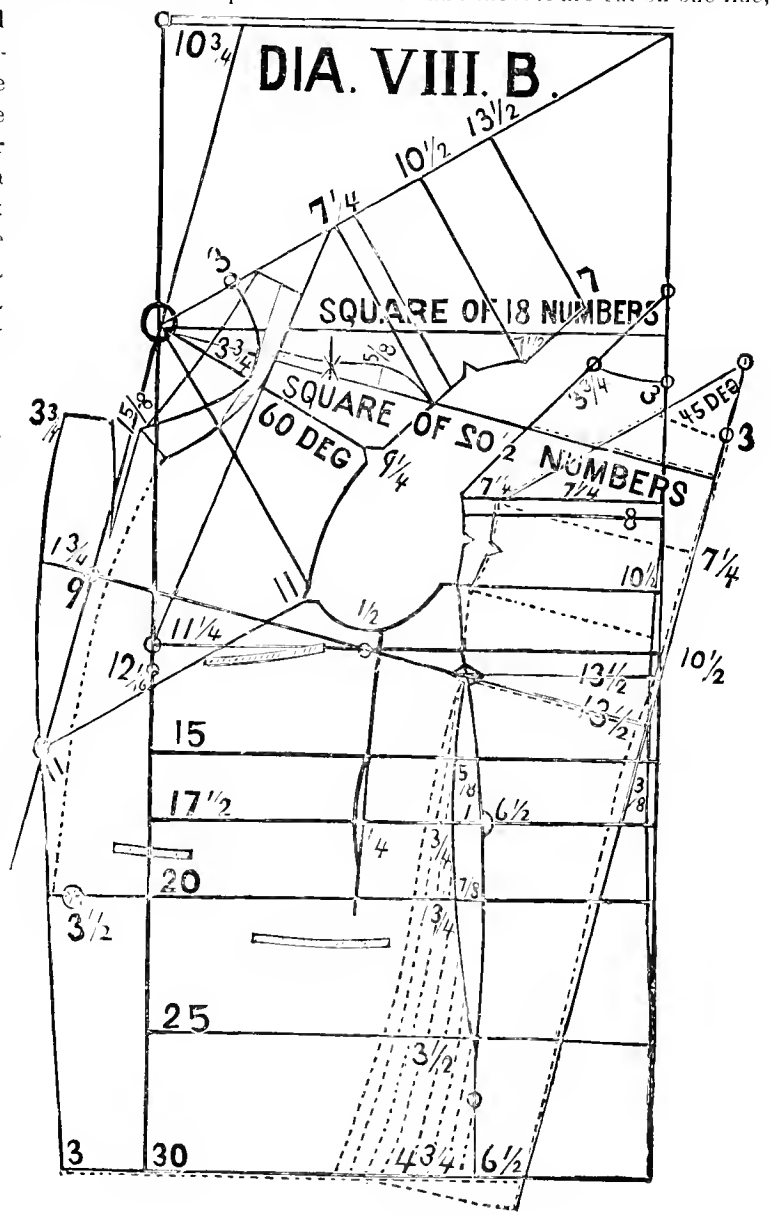
DIA. VIII B.

This is produced here as a fine seamer sack. It can be used as a three seamer by taking a trifle more out between the back and side. For a short roll allow 1 inch in front of point 9 only, and reduce the gore under the lapel to about $\frac{1}{4}$ inch. The back is hollowed out $\frac{3}{8}$ at the waist, and the center at the bottom is not thrown outside of the base.

In all other respects it is the offspring of Dia. VIII, and may be a trifle better. In practical cutting it will be found that Dia. VIII is more toward the erect form, because of its back being thrown outside of the base at the seat.

Dia. VIII B, serves another purpose and this is the position of the one back on the square of $20\frac{1}{2}$, in which position the back may be made smaller or wider without injuring the balance of the lengths above $13\frac{1}{2}$. At the neck the shoulder laps $\frac{3}{8}$ for the normal form.

But it illustrates another point. On Dia. III there will be seen an opening in the under arm seam running up in the arm hole, and which opening is balanced for the three-seam sack by reducing that amount between the back and side seam. But the fifth seam on Dia. VIII B, balances that part and the back and the side are cut on one line, from line $11\frac{1}{4}$ up. It gives a real good shape, and the whole diagram may be accepted as good, but the measure must be taken close. For the last year I have closely watched the effects of longer or shorter backs, and I must here repeat that 15 for a frock and 14 for a vest, and $13\frac{1}{2}$ for a sack are good averages. Further: That a more erect form may easily have $\frac{1}{4}$ less, and a more forward, leaning form $\frac{1}{4}$ more, and a form like the third form in "Models" may have $\frac{1}{2}$ to $\frac{3}{4}$ more length.



But the arm holes must remain the same, and whatever the back is made longer, must be reduced again in the length at the back armhole. On a frock coat this can easily be done by reducing said length between the back and side piece, because of the curved seam; but on a sack, with its straight side seam, such reduction would not take up length, but width, and such extra length may be taken out of the shoulder seam, providing the back notch for the sleeve is thrown that much further down.

Again, if the back is to be shortened the contrary alteration must be observed, but $\frac{1}{4}$ to $\frac{3}{8}$ less back, may be the extreme amount for an erect form, while a stooping form may require $\frac{3}{4}$ for the extreme. Stretching the center of the back in length about 4 inches sidewise and at the point of the blade, will have the same effect, providing the coat maker will do it, or is instructed to do it.

A hot iron in the hands of a skillful tailor is a mighty factor toward making a garment what it ought to be.

DIA. XXIV

Is also submitted as an after thought. I doubt if any pants can be made which fit better than this did on the person it was made for. It is a broad fall with the waist band cut on. The diagram itself shows the measure of the man it was made for. The space between the top of the "fall" and the top of the "fall piece" should never be less than 1½ inches and may be made 2 inches. The "fall" should be cut wide for small waisted men, and narrow for large waists, and each cutter must be able to judge for himself how wide each should be, and again, where the pockets are to be made and where the button holes should be made, in order that pockets and buttons do not interfere with each other.

DIA. XXV

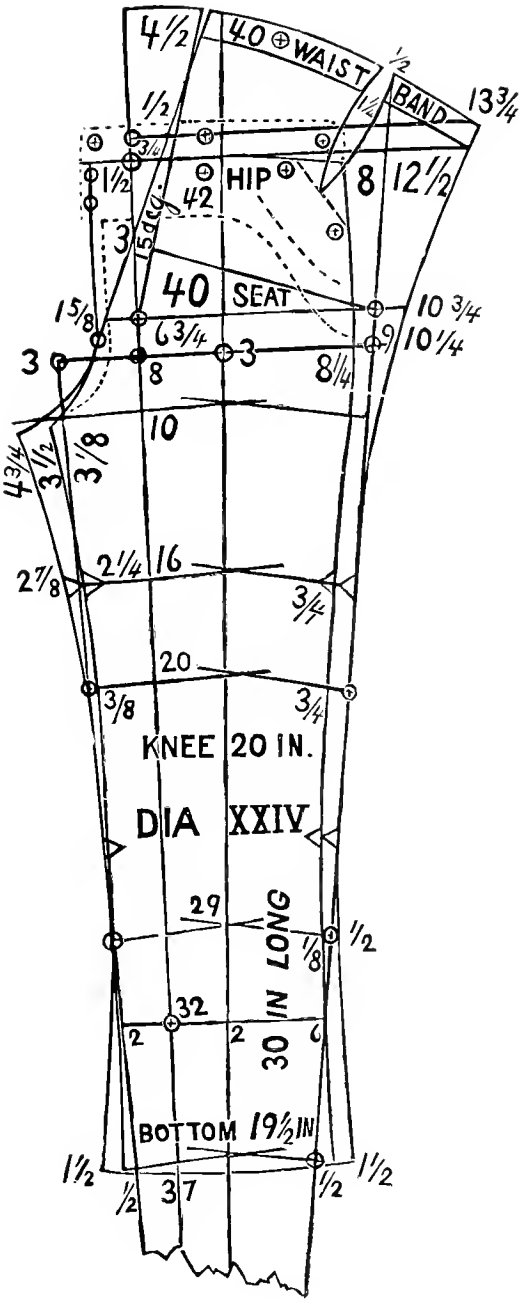
Represents a boy's knee pants of 29 seat measure, and it will prove to be good. I have made the back and front evenly wide at the bottom, but there is no law against making the fore part ½ smaller on each side, and the back that much wider. Add the waist band for suspenders. But if it is cut for a smaller size and worn on a waist, the 10 numbers are long enough for the waist.

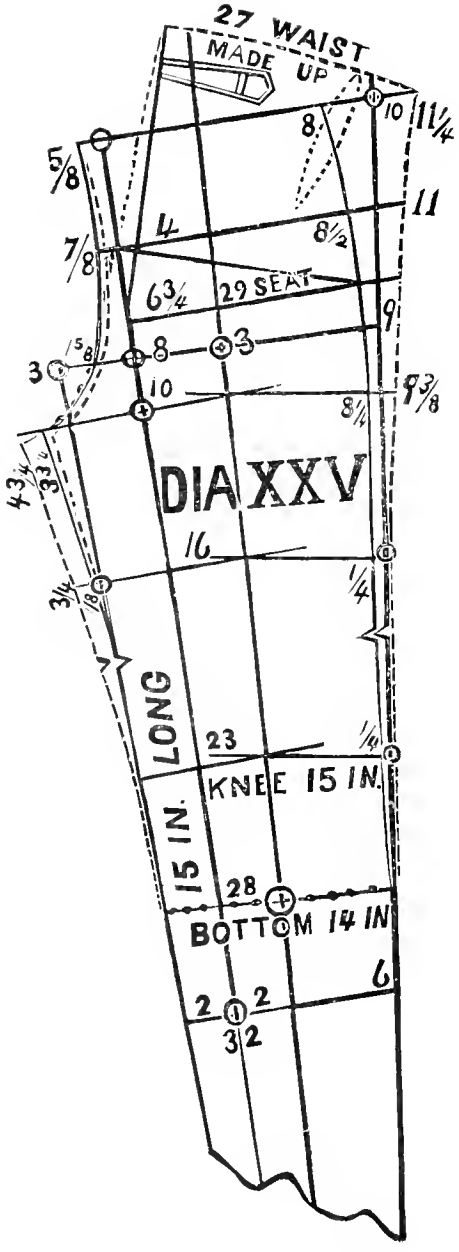
TIGHT PANTS.

In a few years pants will again be worn smaller at the knee, and Dia. XIX must be reduced at the knee and at the thigh. It is hard to tell what the bottoms will be then, but for all that the center of foot and heel is here for a guide. Time will show if pants will then be made with large spring bottoms or whether they will be made again as they were a few years ago, hardly large enough for the leg to pass through. But I will say this. Dia. XIX will fit at the seat and upward for any style. At the fork it may be reduced one seam on the forepart only, and at the side of thigh it may be reduced one seam on each back and on each front, for a close fit.

At the side of the knee the angle of 10 deg. may be hollowed out ⅝ to ¾ on each back and on each front, or so much as the inward curve of side of the knee will warrant. At the inside of the knee allow ½ to ⅝ on the double to the angle of 10 deg., all of which will produce a knee of about 18 inches made up, and that will be pretty close for a seat of 38. Again, if size 38 is reproduced for a size 35, the knee will be about 18½ inches made up, and if from this is taken away ½ inch on each forepart and on each back at the side of the knee to represent the hollow of the leg there, and which is not shown in the present style, the knee will make up 17½ inches which again is a fair width for a narrow leg for size 35.

Another good way to produce a close fitting knee is this: From the center line of the angle of 10 deg. measure both ways and give on the double inseam ¾ inches more than on the double outside, and this rule will hold good on all forms, because the center of the angle of 10 degrees is the center for the pants leg, but the inside of the leg is straight while the outside is hollowed out about ¼ inches, and that hollow must be imitated in order to make a close fit of the pants.


4½
40 WAIST
½
¼
BAND
13¾
½
¾
1½
42 HIP
8
12½
3
15 cg.
40 SEAT
10 ¾
15/8
63/4
3
9
10¼
3
8
8¼
10
43¾
3½
3⅜
2⅞
2¼
16
¾
20
⅜
¾
KNEE 20 IN.
DIA XXIV
29
⅛
½
IN LONG
32
2
2
6
30
BOTTOM 19½ IN
1½
½
37
½
1½

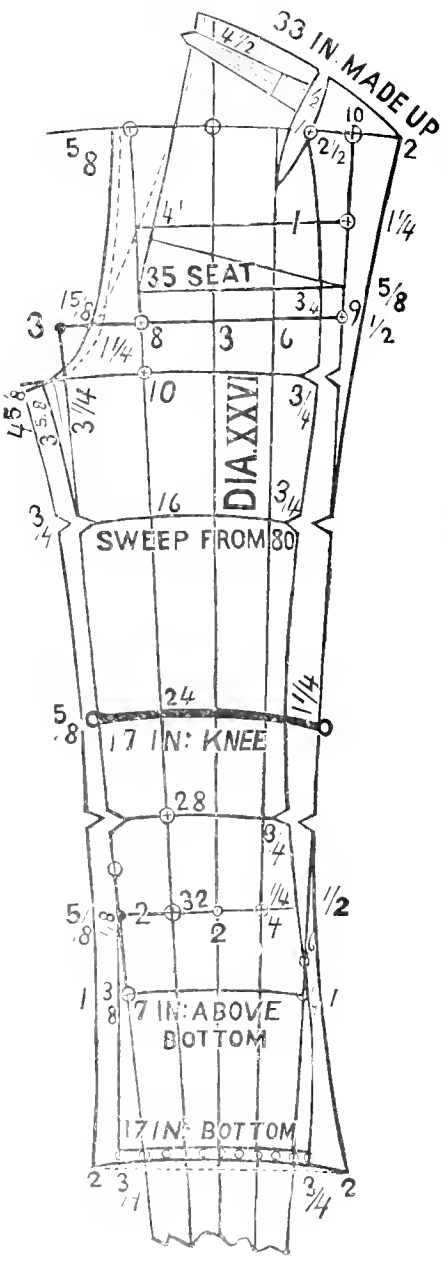

27 WAIST
MADE UP
10
11¼
8
5/8
11
7/8
4
8½
63/4
29 SEAT
9
3
8
3
5/8
10
9⅜
8¼
43¾
3¾
DIA XXV
16
¼
¾
LONG
23
¼
KNEE 15 IN.
15 IN.
28
BOTTOM 14 IN
6
2
2
3
2

(Copyright.)

DIA. XXVI.

But in order to show the correct idea of a close fitting pants, I have added Dia. XXVI to the supplement. It is for a form which will go with Dia. II. Seat size 35, waist made up 33, knee and bottom 17 in., length of legs 32 in. It may be called old style now, but it will be in style at the close of the Nineteenth century, or certainly at the dawn of the Twentieth century.

For spring bottoms allow on each side of the back, starting about 5 in. above the bottom, and take away from the bottom of the forepart an equal amount on each side, or so much until the forepart is reduced to less than 7 in. Dia. XXVI is marked "7 *in. above bottom*" for the reason that the width of the pants, about 7 in. above the bottom, must be the same, no matter if the legs are 30 or 35 in long. The seams are notched from a sweep having its pivot at point 80, which of course is cut off on this diagram. Sweeping each side separately from the bottom of the pants and on each line of the angle of 10 deg. will result in the same thing.



The diagrams in the whole book represent the following seat sizes: 29, 35, 38, 39, 40, 46; and it seems to me that any new beginner should be able to control the different parts in the intervening sizes.

As to coats, there will be no trouble to cut them with the scale and according to instructions. But for pants, the scale can only be relied on for the crotch or fork; all other points, such as waist, hip, knee and bottom, must be cut according to the measure. Hence the pants diagrams are given in different sizes. The fork as given by the scale is large enough with 4 on double cloth for the dress side, but may be made with $4\frac{1}{4}$.

I will again warn a cutter against giving more fork for extra looseness, nor to allow behind on top of back for extra waist proportion, but to allow all extra cloth at the side, unless it is for a large waist, when it is to be cut like Dia. XX or XXIV. The top line of the back slope of 15 deg. is large enough for all forms, and besides it is large enough to buckle up $\frac{1}{2}$ on each side of the back seam, and which may be cut away there, or may be cut away in the gore in the middle of the back when an extra close waist is to be made. The back slope must remain permanent, and all changes made sidewise or forward.

I will here add two very important points in altering pants: Pants which must be cut down because they are too large in size can always be made better if they are opened in front and cut smaller there and down to the knee. It is true, it may take one hour longer to do it than to make the alteration behind, but if a pants is worth altering, it is worth altering right.

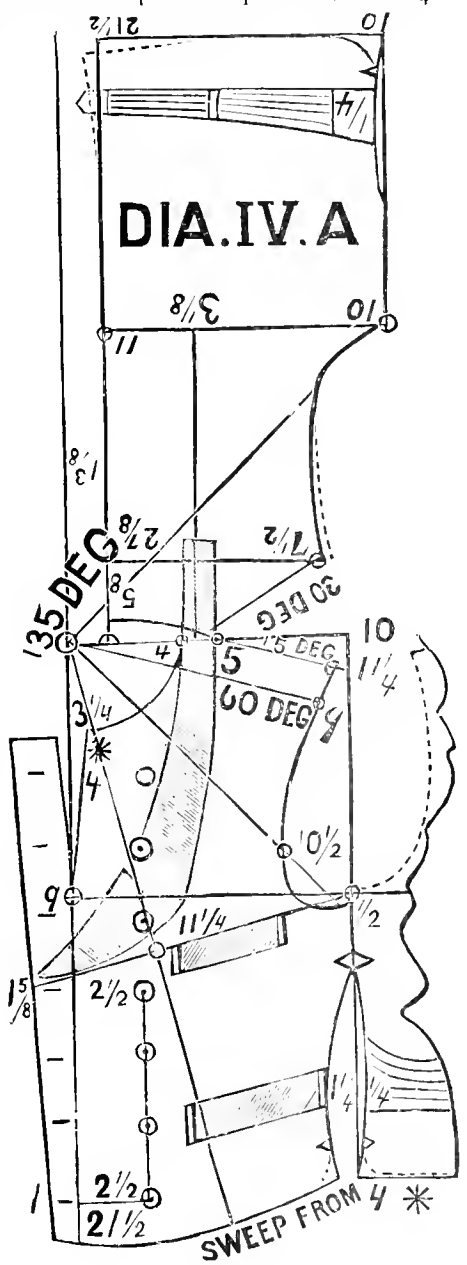
About six months ago I thought I would try a few pants with the fork points cut $\frac{1}{2}$ in. higher, leaving all other points the same, but they turned out to be first-class failures. They were too short at the bottom, and fitted only when the legs were spread apart several feet, and in which position they were long enough, but when the person sat down they crawled up to the top of his shoes. From this I drew the following conclusion: Stretching the inseams will throw the legs sidewise, and will have the same effect as cutting the crotch higher, and whenever pants work that way, the fork points should be cut down about $\frac{1}{2}$ inch, but without disturbing the point in front of line 8 any more than can be helped, but the fork width must be re-established. This may make the bottom short, and requires the legs to be let out below, but it will establish a better fit. I will here again point out the fact, that the inseam stretches more easily than the outside, and cutters must provide for such defects, from whatever cause they may originate.

I cannot specify amounts, but can only point out the way of alteration, either after the pants are made or before they are cut, and will only add: Cutting the fork ½ inch down will cause the leg to be thrown 1½ inch more toward the center of the leg, and ½ inch of alteration may be considered the extreme alteration for any pants cut according to this work. If a pattern is cut for pants with plenty notches at the seams, a cutter can soon find out whether the seams have been stretched, and how much.

It pays to cut all garments over patterns.

DIA IV A.

I also add a double-breasted vest. Knowing what trouble I have had myself in getting the front of such a vest to fit, I came to the conclusion that this work is not complete without such a diagram, and Dia. IV A is presented. It has the neck and the shoulders on the same principle points as Dia. IV, and it only remains for me to say a few words about several points. At the bottom of the armhole the back is placed at point 11, and is ¼ of a number longer than in Dia. IV, but that ¼ extra length of back should be given to a double-breasted vest because the long and open front can settle better to its place. On account of the large curve in front, the neck band is about ½ inch higher behind, thus giving less spring, and for this reason the side of the neck should be pretty well stretched. The diagram itself furnishes no spring outside of the angle of 135 deg., but ¼ may be given and the back sewed on smooth.



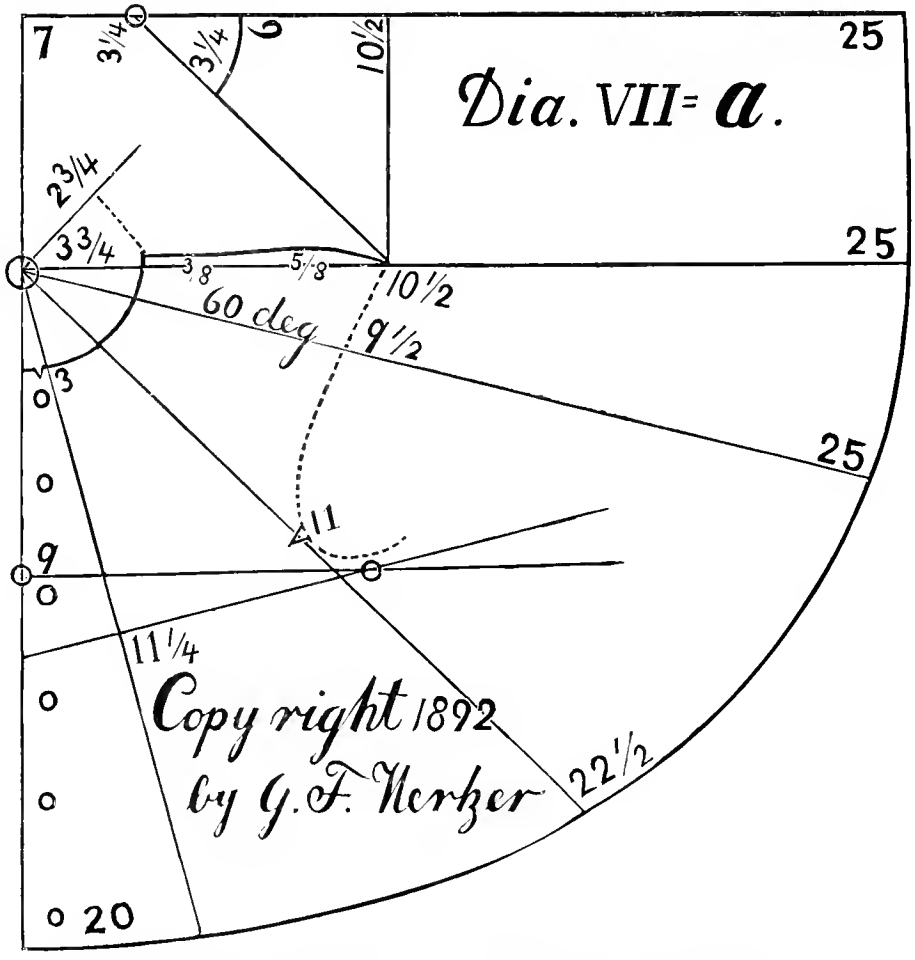
The gore under the collar should be cut for all such vests, but that gore should hardly be more than the two seams. If the seam is drawn together a cut of ⅜ is plenty, providing the neck is not stretched again by sewing the collar on. The bottom of front is represented with a good sized "*lap over*," and if less is desired take ¼ inch off at the front edge and set the buttons ¼ inch forward. The buttons are 2½ numbers backward of the straight front line. A double-breasted vest, to button up to the neck, must have a large gore under the collar as shown in Dia IV A, for two straight pieces will never fit the chest of a man when they are to be lapped over each other from three to four inches. For the whole bottom of the forepart sweeps from 4* and the lap over will fit. This sweep must extend through the whole front angle of 15 deg. and may be swept clear back to the side seam, as shown in Dia. IV A, but may be sunk down ½ inch at the side seam, starting at the plumb base line.

Notch the shoulder from a sweep from the side of the back or at a point 4½ numbers from O on the top square line. Dia. IV A is shown with a large open front and well curved out, but may be cut straighter or higher, or even lower to suit fancy or style. A customer may put up with a coat that shows the corners on each side of the bottom of the front, but he will not wear a double-breasted vest with one side longer than the other, and it is astonishing how many such vests are found, especially amongst the ready made clothing. That defect is not caused by cheap ready made work, but it is caused by the designer of the patterns over which such vests are cut, and for which clothing manufacturers usually pay a liberal price.

Writing about ready made clothing brings me to another point. Coats cut over Dia. II, VIII B and X, will give a better average fit and a nicer shoulder and an easier armhole, than the great majority of ready made clothing can boast of, and the same is true of the pants and vests.

DIA VII A.

I also give Dia VII A, of which Dia. VII is the parent pattern. This Dia. VII A requires no particular description, except that the back of Dia. VII is swung from point $10\frac{1}{2}$ at the armhole shoulder seam, and the ordinary spring in the shoulder seam is added. In the position of Dia. VII A the cutter may easily throw the shoulder seam more forward at the armhole if he so desires it. The neck band must be a straight piece, as wide as button holes can be worked in, and the neck band must be put on loose at the side of the neck. The width in front, and the depth of the neck in front must be regulated according to the coat The depth of the front of neck is placed at 3, and is as high as any cape may stand, but it is easy to cut it $\frac{1}{2}$ lower. A cape may be cut without neck band by allowing say $\frac{5}{8}$ inches on top of top and side of back, and by allowing a $\frac{5}{8}$ short spring in the shoulder seam, and giving a good stretch besides.



The last illustration I present is the "*Collar as it Must be Pressed*," the full description of which is found in the article on "*Collars*."

AS THE COLLAR SHOULD BE PRESSED

Kurze Wiederholung einiger Hauptpunkte.

Die Einteilung der Maßstäbe ist folgende:

Das halbe Brustmaß, oder das halbe Sitzmaß zu welchem 2½ Zoll gerechnet sind, für alle Größen, werden eingeteilt in 20 gleiche Teile, so daß das gewöhnliche Zollmaß der Maßstab ist. für die 35 Größe, Brust oder Sitz. 17½ Zoll ist die Hälfte von 35 und 2½ Zoll zu 17½ Zoll gerechnet macht 20 Zoll.

Die 2½ Zoll, welche zu jedem halben Brust, oder Sitzmaße gerechnet sind, machen die kleineren Größen groß genug, und die Größern klein genug, für alle Größen.

Das Maß wird über dasjenige Kleidungstück genommen über welches es getragen werden soll. Bei Hosen muß natürlich das Maß über die Hose selbst genommen werden, aber deßhalb muß man auch das Maß ganz straff anziehen, wie beim Messen eines Ofenrohrs.

Das Maß für die Hose muß über den größten Teil des Sitzes genommen werden, einerlei ob die Hüften oder der Unterleib größer oder kleiner sind, als der Sitz selbst.

Für Hosen ist der so eingeteilte Maßstab nur vollkommen hinreichend für den Sitz, oder den Schritt, und die Seiten naht, gegenüber des Sitzes. Alle andern Weiten von der Taillie bis zum Fuße, müßen nach dem Maße geschnitten werden. Um es aber Anfängern leichter zu machen, sind alle Zeichnungen in diesem Werke von verschiedenen Größen ge geben, weil die Größen von 25 und 50 ein ganz anderes Verhältniß am Knie verlangen als die Größe von 35.

Das Maß für Röcke und Westen muß auch eng genommen werden, obgleich nicht so eng, als für Hosen. Auch muß das Brustmaß den größten Teil des Schulterblattes einschließen. Für die Weste ist das ganze Brustmaß gewönlich 1 Zoll kleiner als für den Rock, und für den Ueberrock gebrauche man jeder Zeil 2 Zoll mehr als für den Unterrock.

Um die verschiedenen Winkel, welche in den 135 deg. enthalten sind, recht zu bekommen, nehme man einfach dia I. oder irgend ein anderes, welches die Einteilung der 135 deg. zeugt, und mache die Lienien so lang, wie sie erforderlich sind, um ein Muster in voller Größe zu zeichnen.

Für Röcke und Westen kann man sich für alle Größen verlassen, ausgenommen für die Längen, und für die Weiten, des Unterleibes.

Obgleich die Weiten der Schultern besser mit diesen Maßstaben ermittelt werden können, als mit irgend einem andern Maße, oder mit irgend einer andern Berechnung, so will ich dennoch hier erwähnen, daß alle Größen von 23 bis 44 mit dem Verhältniße deß Maßstabes erzielt werden können; aber wenn man über 44 Brustweite hinauf kommt, so sollte man an dem Armloche und derjenigen Linie, welche mit 60 deg. bezeichnet ist, 1–16 für jede höhere Nummer abrechen, so daß ein 50 Brustmaß nicht über 8¾ an dieser Stelle erhält, und der Rücken sollte nicht über 6⅞ Weite haben am punkte 8, oder an dem Centrum des Aermels. Auch sollte die Tiefe des Armlochs in demselben Verhältniße erhöht werden. Während das vordere Armloch an der Lienie von 45 deg. bleibt, wird dann der vordere Aermelzwick vielleicht ¼ bis ⅜ höher gestellt. Wenn dieses beobachtet wird, so wird die Schulter niemals zu breit werden für die größeren Nummern.

Die Schultern wachsen niemals in ihrer Breite zu dem Verhältniß der größern Brustweiten.

Man wird niemals verfehlen den Aermel in das Armloch zu passen wenn man dia II. VII. und X beobachtet. Dia. VII. zeichnet ein kleines Armloch welches sehr gestreckt werden muß, während dia. II. ein größeres Armloch giebt, aber mit demselben Aermel und daher nicht so viel gestreckt werden braucht.

Das Armloch und der Aermel von dia X. sind vollkommen groß genug für einen Ueberzieher. Für das Einnähen des Aermels, beobachte man genau die Einzwickungen des Armlochs und des Aermels an dia II.

Dia III. VII. VIII. VIII=a X–X=a sind die ersteren Platten welche ich habe machen lassen, während II. II.=a. II.=B. VIII.=B. die letzten Producte meiner Arbeit sind, und die Armlöcher und die Einzwickungen sind eine Verbesserung. Ich schäme mich nicht zu sagen, das ich heute mehr weiß, als vor einem Jahre, und ich hoffe, daß ich heute über ein Jahr mehr weiß als heute.

In Bezug auf Hosen, sei hier gesagt, daß die Einteilungen der verschiedenen Zeichnungen vollkommen genügen, um dem Anfänger sogleich einen bessern Ueberblick über die ganze Hose zu geben, als er es irgend wo finden kann. Nur dieses will ich hier noch bemerken: Der Schritt für die **„Bekleidende Seite"** ist groß genug mit 4 Nummern, für die hälfte der Hose, doch mögen 4¼ gebraucht werden, und was man an der vorderhose abbricht, erlaubt man an der Hinterhose.

Die sogenannte Abstechung der Hinterhose ist niemals zu verändern, sondern sollte genau nach den Zeichnungen ge macht werden. Jedenfalls sollte niemals etwas hinten erlaubt werden für größere Unterleibsweite, sondern alles was der Bund mehr verlangt, muß an der Seite und vorn erlaubt werden. Wird der obere Teil der Hinterhose, am hintern Ende weiter geschnitten, so wird das Resultat dasselbe sein als wenn man den Schritt kleiner schneidet. Es wäre dasselbe als wenn man Tuch am vordern Armloche erlaubte, denn je mehr man erlaubt, desto kleiner wird das Loch. Für eine enge Taillie kann man noch ¾ Zoll am obern Teile der Hinterhose abnehmen, aber für eine größere Weite ist das Gegenteil nicht anzuwenden.

Das halbe Hosenbein besteht einfach aus einen Winkel von 10 deg. zu welchen 1¼ am Schritte (an der größten Seite) erlaubt wird, und am obern Ende der Vorderhose nach vorn ⅜, während der obere Teil der Hinterhose 15 deg. abgestochen wird, wie es in allen Zeichnungen zu sehen ist.

Oben, an der Seite des Winkels von 10 deg. ist die Hose vollständig.

Zwischen dieser Seiten Linie, und den abgestochenen 15 deg. an dem hintern Teile der Hinterhose wird das Unterleibsmaß so angelegt daß nach einem oder zwei kleinen Einschnitten, und nach Abrechnung aller Nähte, die Hose so viel mißt als die Person in sitzender Stellung. Der Unterschied in verschiednen Personen, im Stehen oder im Sitzen mag angenommen werden von 1 bis 5 Zoll, nachdem die Person mehr oder weniger beleibt ist. Beim Maßnehmen für eine Hose, sollte dieses jedes Mal beobachtet werden, zumal wenn das Unterleibsmaß groß ist. Zu diesem Zwecke muß das Maß in sitzender Stellung genommen werden, und es wird immer gut sein wenn die obern Knöpfe offen sind. Sollte der oben besprochene Winkel von 10 deg. nicht groß genug sein für das Bundmaß, so wird nicht nur gar kein Einschnitt in die Hinterhose gemacht, und wenn dieses nicht ausreicht, so wird das fehlende in drei gleiche Teile geteilt, und zwei Teile davon werden an der Seitennaht erlaubt und ein Teil am vordern Teile der Vorderhose, zu dem ⅜ welche schon erlaubt waren, so daß, wenn die Hosen an dem Leibe sind, das größere Bundmaß sich in drei gleiche Teile verteilen kann, ein Teil an der

rechten, ein Teil an der linken Seite und ein Teil vorn. (Siehe dia XX und XXIV.)

Die Zeichnungen für die Röcke und Westen sind so genau und in so verschiedenen Formen gegeben, daß es beinahe unmöglich ist, sie nicht zu verstehen, selbst wenn ein Zuschneider kein Wort von der Beschreibung lesen könnte.

Dia IV. wird in jeder Hinsicht ein gutes Muster schneiden für den normalen Körperwuchs. Die Weite des Hinterteils am Halse sollte niemals weniger als $3\frac{1}{4}$, und mag $3\frac{1}{2}$ sein, und wenn der Rücken an das Halsband, oder an den Kragen genäht wird, so „muß" das Halsband $\frac{1}{4}$ bis $\frac{3}{8}$ angehalten werden, nicht an der Mitte sondern mehr nach der Seite, so nahe als möglich nach der Schulternaht zu. Oder noch besser gesagt, der Rücken sollte soviel gestreckt werden, und um dieses am rechten Platze zu tun, muß der Rücken so weit als möglich geschnitten werden. Sollte man sich nicht auf den Westenmacher verlassen können so erlaube man lieber $\frac{1}{4}$ bis $\frac{3}{8}$ Zoll mehr Länge am obern Ende der Schulternaht welches aber zu nichts in der Mitte dieser Naht aus laufen muß.

Zweireihige Westen können den Rücken $\frac{1}{4}$ bis $\frac{3}{8}$ länger vertragen, indem diese Länge des Hinterteiles, dem Vorderteile Gelegenheit giebt, sich enger an den Hals anzuschließen. Auch sollte jede zweireihige Weste einen kleinen Einschnitt unter dem Kragen haben, oder das Halsloch sollte mit einem starken Faden eingezogen werden.

Eine Weste, um weit genug zu sein, braucht das halbe Brustmaß und $2\frac{1}{2}$ Zoll, an der Linie von 9 bis 14 unter dem Arme, und dia IV. hat dieses Maß für jede Weste. Die Taille braucht dasselbe Verhältniß, und eben dasselbe die Hüften. Wenn aber die Seitennaht 2 bis $2\frac{1}{2}$ Zoll offen bleibt, oder wenigstens so weit, daß sie den Hüftknochen nicht berühren kann, dann braucht man sich nicht viel um dieses Maß zu bekümmern.

Wenn das Unterleibsmaß im Verhältniß größer wird so gebe man von Anfange in der Seite und vorne zu gleichen Teilen zu, nach den aber etwa $\frac{1}{2}$ Zoll in der Seite erlaubt worden sind, gebe man alles übrige vorne zu.

Um einer eingesunkenen Brust eine Weste anzupassen, nehme man einfach dia IV. und lege eine Falte in das Muster von vielleicht $\frac{1}{2}$ bis 1 Zoll, jenachdem der Brustkasten eingesunken ist. Diese Falte muß die Form eines V haben, und muß sich zu nichts auslaufen am untern Ende des Armlochs, ohne das die Seitennaht davon berührt wird.

Keine andere Veränderung ist nöthig, und ich möchte nur noch bemerken, daß die sogenannte Schulterspitze nicht durch diese Verkürzung des Vorderteils aus ihrem Geleise geworfen wird, sondern wie sich die Brust nach und nach gesenkt hat und kürzer geworden ist, so wird auch eine solche Weste verändert, wenn das Vorderteil verkürzt wird.

Diese Veränderung sollte an allen solchen Röcken gemacht werden, denn es ist ein großer Irtum, wenn man glaubt, daß die vordere Schulterspitze eine Veränderung nach der vordern Brustlinie brauche, wenn sich der Hals oder die Brust nach vorwärts senkt. Ein Rock, oder eine Weste wird an den Hals gepaßt von der Seite nach hinten und ebenso von der Seite nach vorne, und wenn sich der Hals vorwärts oder rückwärts biegt, so bleibt die Weite des Halslochs dasselbe.

Es ist merkwürdig wie viele Zuschneider heute noch auf der verkehrten Meinung sind das der sich vorwärts biegende Hals bedinge, daß die vordere Schulterspitze weiter nach der vorderen Brustlinie gestellt werden müße. Um jeden völlig von diesem Irtum zu überzeugen, lasse man einen gut gewachsenen Man einen gut sitzenden Rock anziehen, und dann eine vorwärts, oder auch eine rückwärts biegende Stellung des Halses einnehmen, und jeder der sehen will, kann sich überzeugen, daß der sich vorwärts biegende Hals mehr Kürze der Vorderteils verlangt, nicht aber mehr weite nach dem Centrum des Halses. Jedes so erlaubte Teil nach der Mitte des Halses zu, macht das Halsloch kleiner, der Hals aber nimmt seine Stellung ein, und wirft das Halsloch nach der Seite, und die abscheulichen Falten, an der Seite des Halses welche man an so vielen Röcken und in allen Himmelsgegenden sieht, sind das Resultat.

Es ist mit dem Halsloche dasselbe, als mit dem Armloch. Wenn dieses nicht weit genug vorwärts geschnitten ist, so wirft der Arm den überflüßigen Teil in Falten über die Brust, und wen dazu beide, Hals und Armloch zu klein geschnitten sind so wird das Halsloch nach dem Arm und das Armloch nach dem Halse zu geworfen, und eine vielen Zuschneidern wohlbekannte Falte legt sich von der Seite des Halses bis unter das vordere Armloch.

Um etwaigen nicht englisch lesenden deutschen Zuschneidern den oben besprochnen Irtum genau zu erklären, habe ich mich veranlaßt gesehen diesen Nachtrag in der deutschen Sprache zu geben, und ich hoffe, daß hin und da Einer, oder auch Viele, daraus Nutzen ziehen werden.

Den 21. October 1892, am Tage der 400 Jahrigen Columbusfeier.

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